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THE JOURNAL

—OF THE—

National Dental Association

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THE INTERPRETATION OF DENTAL ROENTGENOGRAMS.

By E. J. Eisen, D. D. S., Milwaukee, Wisconsin.

(Read before the National Dental Association at its Eighteenth Annual Meeting, Rochester, N. Y., July 7, 1914.)

THE correct interpretation of a Roentgenogram is dependent upon one or all of the following details:

The angle at which it is taken.

The amount of distortion.

The correct time of exposure and proper development.

Comparison of the Radiographic and clinical findings.

In dentistry, with its field sharply confined to a small and superficial area, we are able to apply a standard technique; whereas radiography, as it is practised by the medical profession, with deep-seated areas for investigation, presents far greater difficulties. It is our good fortune to escape many, if not all of these discouragements, because the object is placed next to the plate.

In advocating the acquirement of an exact technique in this work, I do so in the belief that our efforts will be more successful and dependable.

In order that a dental radiograph, or any radiograph for that matter, may contain the elements for a correct interpretation, it must be taken by one fully conversant with the results desired. In other words, the operator must have knowledge of the clinical phase in order to apply the technique necessary to demonstrate the condition, if present in the radiograph.

Radiographs often present a good gross picture, but fail in the detail necessary for a finer definition.

This is apparent in many cases of abscesses, and more particularly in necrosed teeth. That much of this distortion may be minimized, or absolutely prevented, an exact technique will be demonstrated, which has in a very substantial manner proven satisfactory.

In all radiographic work, for that matter in all picture work, the first desideratum is immobility of the patient. This

is the more easily accomplished if the subject is made comfortable. In my earlier work it was necessary to place the patient in a recumbent position, but this has now been overcome so that the patient is placed in a sitting posture on a chair facing the stand.

The stand here demonstrated (Fig. 1) is one which has been on the market a number of years, to which I have added an attachment especially designed for dental radiography. The initial adjustment brings the plate holder and head rest in position, allowing the head to be placed either for the occipito-frontal or lateral position. The plate holder and head rest are next paralled with the rim of the protruding funnel.

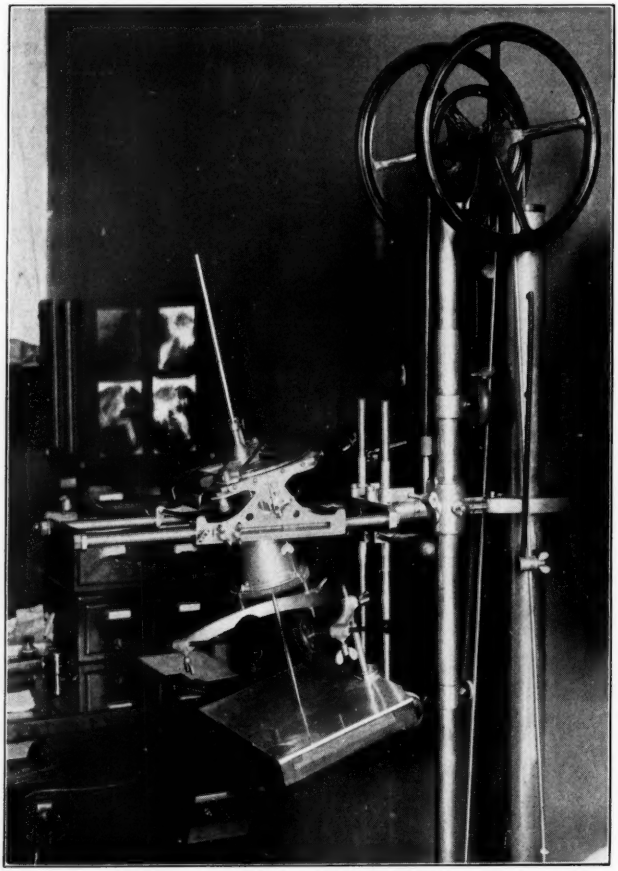

Fig. 1.

The pointer indicating the focal ray is now brought down upon the center of the plate and the point of contact marked for future reference. The pointer is

then perpendicular to the plane of the plate and stands at 90 degrees with reference to that plane. The tube-holder and funnel with the pointer fixt in position therein is now tipped 15 degrees

tube holder is now in proper position for the exposure. This then, is always in position and remains stationary and standardized for this class of exposure. When it becomes necessary to take a

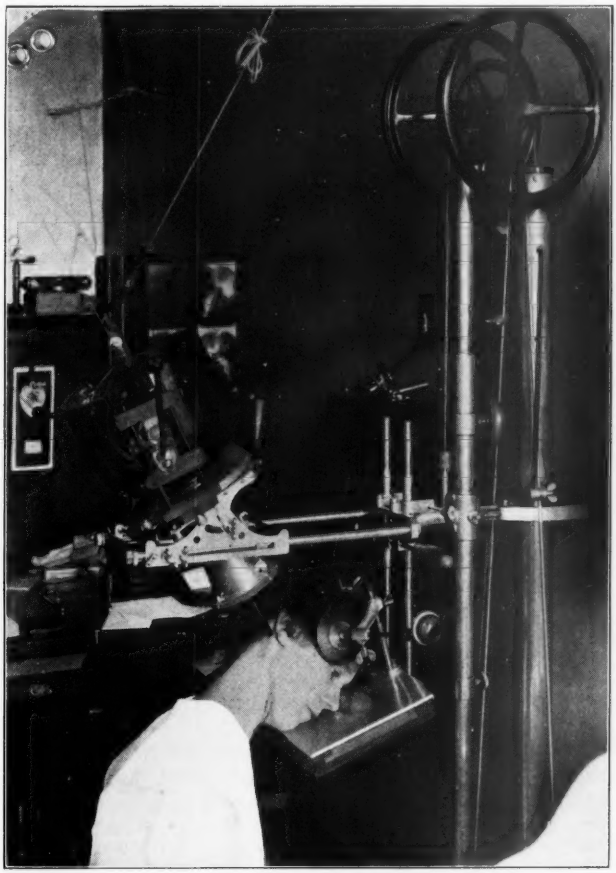

Fig. 2.

and the entire tube is moved forward to bring the focal ray as indicated by the pointer, to bear upon the point at the plate previously determined upon and marked when it was placed at right angles with the plane of the plate. The

film, the angle is reversed and the focal ray is pointed outward.

The stand is now adjusted in height, to make it possible for the patient to rest the head in the proper position, without causing any uneasiness or strain

(Fig. 2). The proper height found, the patient's head is laid upon the plate holder, in such a position that the area to be examined is placed at a point where the focal-ray would strike. The areas for upper and lower maxilla are attained by shifting the focal ray either forward or backward one inch. The area for molars, bicuspids and cuspid are further assured by the position of the nose. For molars the nose is slightly raised from the plate. For bicuspids and cuspid, the nose is flattened on the plate. For these exposures, it is advisible to retract the body in order to prevent the vertebrae from being projected into the area under examination. This method brings the root, crown and surrounding tissues into closer contact to the plate of any position so far advocated. Cieszynski has accurately measured the distortion resulting from these positions and claims that when properly applied, the distortion is less than ten per cent of the length of the tooth. This position and technique accomplishes several things. First, each radiograph presents the same field with landmarks always in similar positions. The thickness of the object and distance always the same, the time of exposure is the same. Immobility is always accomplished. Given the same distance, the current, in a tube, of known and equal penetration and intensity, a developer with known factor, and the correct time of exposure maintained, the results will always be the same, i. e., the degree of density is that desired for this kind of work. Hence, one will readily recognize normal areas in a negative produced by exactly similar technique.

The title of this paper calls principally for the Interpretation of Dental Radiography.

The field which I will consider, takes into consideration only detailed interpretations, and can better be demonstrated by limiting myself almost exclusively as these are apparent on plates. By plates is meant an exposure covering the area, including all the teeth from the cuspids back, both upper and lower maxilla, and the antrum.

We have been called upon to clear up certain foci of infection, which according to present knowledge, are responsible for certain systemic disturbances. That we may not fail in our duty, it is as necessary to determine the extent of a sinus, as it is to locate the tooth causing it.

The one elementary factor of interpretation is, that a Roentgenogram shows only one thing, namely, difference in tissue density. In this, physical laws alone prevail, nothing being left to the imagination.

Air shows the least density, because no rays are absorbed, and therefore reach the plate with full intensity, blackening it deeply, resulting in the so-called high lights.

Water and soft tissue, skin, muscle, etc., have the same density, that is, absorbability for the Roentgen Rays. These allow a lesser amount of rays to penetrate them, and act chemically upon the plate, hence, are accordingly lighter.

Bone tissue has greater density on account of the quantity of mineral, (calcium) salts in its composition. Therefore, decalcified bone shows less density, and eburnated or ebonized bone greater density. The first will be found in rhacitis and tuberculosis, in arterio-sclerosis, etc., the second in tertiary stages of syphilis, or late osteomyelitis.

Enamel shows even greater density than the last mentioned alteration, and metal like gold fillings the greatest.

Pathologic conditions may only be assumed, never asserted. We may say that an area of increased density signifies an abscess, but we ought never positively identify it as such from radiographic findings alone. The extent of infection cannot be determined by a radiogram beyond the line of demarcation, which indicate the destroyed tissue. A round cell

infiltration, however, may cause an area of decreased density due to an inflammatory condition, causing an absorption of calcium salts. An apical abscess is more or less distinct according to the amount of bone tissue destroyed. There is, however, a vast difference in an abscess, be it acute, post-acute or chronic. So called blind abscesses, with but little destruction of hard tissue are often difficult to diagnose. Such abscesses will show but faintly and in many cases will be entirely overlooked. It is in such cases that I enlist the attention, study and discussion of men in this section to determine and give expression to views and knowledge to guide us in recognizing detail in the reading of Roentgenograms.

Distinguishing normal from abnormal is here a question, and I ask the question—"What indicates an abnormal condition where bone tissue is not actually destroyed?"

We see an area surrounding each tooth which we assume to be the "lamina dura" to which Dr. Hopewell-Smith has given the radiographic designation "linea dura." By what sign may we detect an abnormal condition? Is it its thickness, or absence that indicates anything? Assuredly without a clinical examination nothing could be assumed, but even so, it is sometimes impossible to even surmise the underlying condition.

In many cases of blind abscess, so called, it is a matter of study to detect any change in tissue density, and one thing more than anything else is apparent, namely, that absorption from putrescent canals, with attendent absorption of toxins seems to show least evidence upon the negative. In cases of arthritis, the absorption of toxins seems to come mostly from this class of abscess.

The radiological picture may be so questionable as to be overlooked entirely, and in many cases undoubtedly is, thru our hurried and superficial examination of finer radiographic manifestations.

You will here (Fig. 3) note a typical case with an area of decreased density suggesting an abscess. The clinical history is as follows:

Patient, referred, had first molar removed following an unsuccessful treatment of a discharging sinus presumed to originate from an apical abscess.

Fig. 3.

Drainage apparently established thru extraction—temporarily improved. Acute condition again reoccurs. Radiogram locates the offending tooth to be the first bicuspid. The taking of a plate in preference to a film, made it possible, first to locate the abscess, second to trace the fistula to the former. It is maintained that in this case, either or both of these findings may possibly have been overlooked, had a film instead of a plate been employed.

In contra-distinction to an acute apical

abscess the following plate (Fig. 4) is shown, interpreted at the time as a bone Cyst.

When operated upon subsequently by Dr. G. V. I. Brown its nature was definitely established, but not its etiology. You will note quite a difference in this and the foregoing, in that the degree of density within the cavity, and the margin denoting its extent, are very different. Upon clinical examination it also gives an entirely different picture from an api-

Fig. 4.

cal abscess, showing a hard, immovable, non-inflammatory mass. It's extent and its relationship to the surrounding teeth could not have been determined by a film.

DETECTION OF NECROSIS.

Necrosis of a tooth root presents two radiographic manifestations; that of acute destruction of tissue, and that of rarefaction of the calcium salts. The presence of actual necrosis with a destruction of tooth tissue is sometimes difficult to detect because a tooth root presents no definite destruction in anatomical outline. Unless the necrosis has advanced to a degree where loss of tissue may be determined in the roots' length, we may easily overlook the difference in density when destruction has taken place on the roots lateral surfaces.

Interpretation here depends upon assumption as to the length of its chronic pathological state and a practised eye, ready to detect the almost microscopical indentation manifested in the radiograph, so slight that the degree of density on the plate of necrotic tissue appears almost like the cancellated bone of the alveolus. The case now on the screen (Fig. 5) gives a fair example of this class.

Fig. 5.

While necrosis was here assumed to be present, still its existence, and further its extent on the plate was not apparent until the tooth was extracted.

When, however, the tooth and the radiograph were compared, it left no question but that the exact outline of the necrotic area was plainly visible on the film.

THE NECESSITY OF BEING ABLE TO NOTE THE RELATION OF TOOTH ROOTS TO THE INFERIOR DENTAL NERVE.

In many cases of neuralgia, it is imperative to note the relation of teeth to the mandibular nerve. Its contact, or its relationship to the tooth roots must be determined thru its entire course,

from the ascending ramus of the jaw at a point near the third molar, to where it enters the mental foramin.

The mental foramin is in itself a well known landmark. Into this area the Hyoid bone is also projected, and both are often mistaken for abnormal manifestations. With these two factors well established in attaining this position, abnormal conditions can be easily recognized. The Hyoid bone may be projected in such a way that it appears almost like a tooth root, but, when recognized and eliminated as a factor, it will cease to be an element of doubt.

Many radiographs show a close relationship of teeth to the inferior dental canal. When, may I ask, would its actual contact be demonstrated?

Your essayist has often surmised a close relationship, but a point I would like to have cleared up is "What constitutes radiographic proof of contact otherwise than that demonstrated stereoscopically?

The picture now on the screen (Fig. 6) is one taken to determine nerve irritation in a case of epilepsy.

You will note an area of decreased density immediately below the second right molar. The question is asked, "Does this area include, or in any way give evidence of having reached a point which would indicate contact with this nerve?"

The case was referred to me by the attending physician with instructions to eliminate all peripheral irritations. Extraction of this tooth gave no apparent results. However, while treating the case for a rather advanced stage of pyorrhea of his lower anterior teeth, he had an attack immediately when instrumentation progressed to a point near the apex of his lower right lateral incisor.

Fair progress, that is, a lessening in the number and severity of the attacks has been accomplished, but no cure.

The question remains unanswered in my mind, as to whether the destruction of bone tissue below the molar was sufficient to include an area which would be termed, "Contact."

POST OPERATIVE RADIOGRAPHIC ASSUMPTIONS IN BONE RECONSTRUCTION.

Following an apparently successful pulp canal treatment, either medically or surgically, we look for proof to the

Fig. 6.

radiograph in the reconstruction of bone tissue surrounding the apex. The reconstruction period complete, what does the radiograph show? It shows an area hardly distinguishable from normal. Our present knowledge of radiography limits us to a differenciation of tissue density. Continued study of the same radiograph brings out detail which at first glance is generally overlooked. But the presence of pathogenic germs must in some manner give evidence of their action. A close study will sometimes

give evidence which should be understood. When systemic manifestations of infection are present, may we assume that a tooth with a putrescent canal properly treated and filled has been returned to a normal condition? Dr. Rhein has shown reconstruction of bone radiographically, but no one, to my knowledge, has been able to prove that such a reconstructed area is free from pathogenic germs. When blind abscesses, with practically no destruction of tissue, are not apparent radiographically, what right then have we to assume that reconstructed areas are normal? In cases of Arthritis, or for that matter any serious result of infection, how may we as dentists give satisfactory evidence of having eradicated such foci which are held responsible for these disorders without extraction?

Fig. 7.

Fig. 8.

The case now upon the screen (Fig 7) gave the following history: Articular Arthritis dating back three years—urethral examination negative—tonsils removed—Frontal Sinuses drained—Ethmoids drained—Vaccine treatment.

My interpretation was as follows in this case: Lateral normal, cuspid imperfect canal filling, first bicuspid imperfect canal filling, first molar no canal filling with area at the apices indistinct and of decreased density. Second molar, pulp chamber filled but not the canals. Extraction of bicuspids and first molar substantiated the presence of an abscess sac on the molar, and disclosed a necrotic apex of the bicuspid.

The lower second bicuspid canal but partially filled, the apical end of root interpreted as being necrotic because of the difference in density from the other part. Extraction of this tooth proved a a correct interpretation. The first molar had fairly well filled canals with no radiographic manifestations of abnormality. (Fig. 8) Upper right lateral, cuspid and bicuspid surrounded by normal tissue.

First molar has partial root filling, but with no abnormal radiographic manifestations at the apices. The entire lower mandible assumed to be normal. Extraction and treatment of the teeth mentioned, was not followed by any appreciable improvement of arthritic conditions. All other possible foci of infection eliminated, the attending physician insisted upon further examination of the mouth to discover any other focus. A careful re-study of the plates and films failed to show any further evidence of pathological conditions. However, yielding to the physician's judgment, I commenced to drill into each tooth in the mouth, to determine whether any other teeth contained dead pulps. This resulted in my discovering that the upper right central, upper right cuspid and lower left central contained putrescent canals. These three teeth last mentioned, gave no evidence as regards color or radiographically of being in a diseased condition. Treatment of these canals has not resulted in any betterment of the patient's condition. There may have been evidence of changes in tissue density here, but with my present experience I failed to distinguish them.

ACUTE OR CHRONIC CASES.

Faulty phraseology is often used in trying to express whether a lesion is acute or chronic, recent or old, there being no characteristic roentgenological points of differenciation to warrant any such term.

The accompanying radiograph (Fig. 9) was taken to determine the cause of irritation following the filling of a root canal. It shows clearly an area of lessened density around the apex, of the lower second bicuspid, with a line of increased density in continuity with the root canal. In other words, the root-filling was forced out thru the apical foramin, causing local irritation, visible in the area of decalcified cancellous tissue. Here an acute stage without infection is underlying, the irritation being due to formalin in the root-filling material. A chronic irritation will naturally give the same picture.

Most men, unaccustomed to the interpretations of radiograms, fall into the error of trying to make an etiological diagnosis from the negative.

Just as the expression, "kidney stone," is heard in medical parlance, so in dentistry the word, "abscess" is employed, when the only conclusion that can be drawn from a radiograph is that of an area, or in a stereo-radiogram of a cavity of lesser density of tissue. The nature of the contents must find clinical explation. The word syphilitic, tuberculous, etc., should not be heard in making a Roentgen diagnosis.

Fig. 9.

The film (Fig. 10) shows how a radiogram may nevertheless help clear up the obscure etiology of a cavity filled with pus. In this case, pus was exuding at a point above the first bicuspid. The radio-

graph shows the location, extension, and relation of the cavity to the adjacent teeth, but not, of course, the source of infection.

Removal of the crown, also root-filling of the first bicuspid, and drainage thru this root giving no relief, the tooth was extracted under the belief that necrosis at the apex was the cause. The extraction also having no effect, the second bicuspid was drilled into and found to contain a dead pulp. Suitable treatment now cleared up the diseased area and established the etiology.

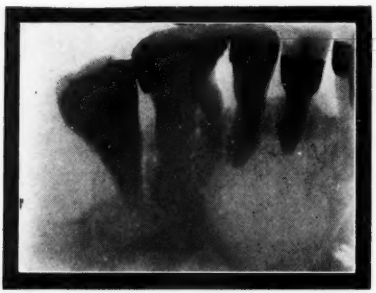

Fig. 10.

RELATION TO SURROUNDING TISSUE.

It is important to ascertain the relation of a lesion to the surrounding tissue. This can only be shown with a plate, if possible stereoscopically. The relation of cavities, containing pus, to the teeth, as well as to the superficial tissues, the relation of growths, benign or malignant, to the adjacent tissues, and the involvement of surrounding tissues, must be looked for. Visible changes shown up by the X-Rays, are destruction of cancellous bone tissue, especially noticeable around the roots of teeth, irritative opposition of calcifying pericementitis and calcifying periositis.

The accompanying radiograph (Fig. 11) is that of a patient referred by Dr. G. V. I. Brown, with a tumor of the lower jaw, being external, but not movable upon the lamella, egg-sized, round and firm. Its origin, the involvement of tissue, and its etiological nature were sought for. The radiograph shows involvement of cancellous tissue, but ill defined in its limitation, to this and to the soft tissue, protrusion of a calcifying nature into the soft tissue, spreading out in fan-shape, lifting a piece of the bone-lamella

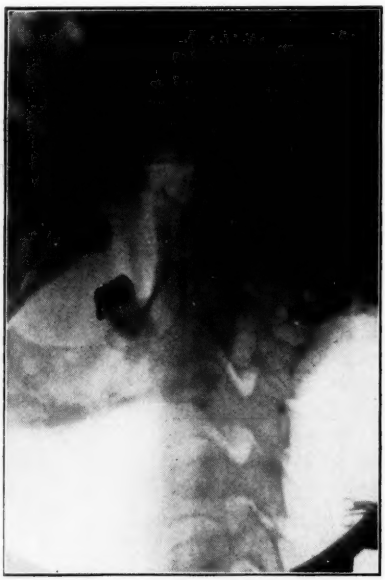

Fig. 11.

and causing a zone of reactive calcification around the border, not involving the molar, however, or originating from any subinvolved tooth root, as at first surmised.

These characteristics justify one in assuming a malignant growth of a bony nature, involving a large area of the lower jaw. The operative removal disclosed an osteo-sarcoma of unknown origin.

Until the last few years, we have only been called upon to look for the abnormal, as regards developmental pathological manifestations. The location of un-

erupted teeth, broken roots and the like, fail to present the interest and study to those enlisted in the work of more serious disturbances.

As a seeker for knowledge it is my earnest plea, that those interested in this work, give of their experience and knowledge, that we may profit by it.

Discussions.

M. L. Rhein, M. D., D. D. S., New York City, N. Y.

It is a great pleasure to listen to a paper on this important topic which describes with simplicity of language and clearness of thought the detailed technique.

The author appears to devote his attention entirely to the use of glass plates in contradistinction to the small films. Our one great difference of opinion is involved in this question. The glass plate has a value in giving a gross view of the dental organs in their entirety and precludes the danger of the diagnostician losing sight of some particular pathologic point. Its value as compared to the film appears, however, to end there as far as it relates to a diagnostic study of any local abnormality. There is nothing that the essayist has said about the advantage of an exact technique that does not apply to the film as well as to the plate. When the dentist finally has found the exact spot in the jaw upon which he must base his judgment and plan of operation, the method by which the minute detail of this small area is best portrayed becomes the most valuable. It appears impossible to correctly focus the ray at one tooth on a film without getting better detail of tissue than can be obtained with the same technique when the focal ray must be directed against practically most of the jaws.

As the author has said, immobility of the patient is the first essential desideratum. If this immobility can be maintained, as it most frequently can for twenty seconds, much sharper detail, and consequently finer diagnostic discrimination of tissue can be secured, than if the power and penetration of the ray is doubled so as to obtain a good picture in one-half the time. A satisfactory picture with a given tube requires a ray with a given amount of power and penetration. This resulting total of energy can be obtained almost instantaneously, as in the flash picture or prolonged by time exposure. Numerous experiments appear to make a twenty second exposure far more valuable for diagnostic purpose than exposures of lesser time. Thruout this valuable essay is heard the cry for aid in being able to make the fine discriminations that are necessary in order to substantiate a positive diagnosis. Frequently the stereoscopic picture becomes invaluable, but this often fails to meet the requirement.

The essayist has very tritely drawn attention to the fact that location of the dental organs and the nature of the involved tissues make it possible for the dental Roentgenogram to surpass in accuracy of the detail, the Roentgenograms of other human tissues. It is our belief that this discriminating detail can be still greatly increased, and experiments with this object in view have been under way for some time.

There is a close bearing on this important point, and the implied criticism of the essayist against the general radiographer taking dental Roentgenograms.

His criticism of dentists having the pictures for their patients taken by men who have not been thoroly educated as dentists, is most timely, but altogether too mild. I have yet to see one of these radiographers who have only a medical education, display any accurate knowledge of dental tissues even after years of work in this field. Their interpretation of the Roentgenogram would often appear ludicrous, if it were not for the fact that the following of so many incorrect interpretations was productive of evil instead of good. Incorrect interpre-

tions with their consequent evils, grave as they may be, should not be charged against the correct radiographic outfit where the technique has been standardized.

Only one thing need be guarded against when this has been properly done, and this is the change in the tube. If the operator sees that this is kept to a certain pitch, the machine will always be efficient. Very justly, however, there has been great criticism of the incorrect interpretations that have been sent to dentists and some of them from dental radiographers. Inasmuch as this criticism tends to interfere with the use of the great diagnostic aid in dentistry, it is unfortunate.

The real cure for this evil would be in doing away with the general radiographer and having every dentist do his own radiography.

This practise is becoming more and more general as the dentists comprehend that the best Roentgenogram diagnosis can only be made by the dentist who is familiar with the observed tissues in a given patient. The smallest detail in this history of what has transpired to those tissues can frequently be the deciding point in a case of doubtful diagnosis. In this respect the value of a correctly kept charted record of dental service can not be too highly estimated. Without this knowledge of that minute history the dental radiographer can easily err in his interpretation of a referred patient; how much easier is it for the medically educated radiographer to err? In reading many of these incorrect interpretations I have been imprest by the reckless and fearlessly positive way in which these pictures are misinterpreted.

The correction of this matter is not difficult. The radiographer who is not the attending dentist has no legitimate claim to act as the interpreter of the picture. He may by his advice in explaining what the dentist may fail to see, become a most valuable consultant. The dentist, even if he has no outfit, should make the interpretation of Roentgenograms a study so that he knows the nature of tissue he is looking at. He then will apply his knowledge of conditions present and past to the case, and the opportunity for error will be greatly diminished.

There is no fault to be found with the essayist on this important matter, because as far as he is concerned, he covers the ground when he says, "Pathologic conditions may only be assumed, never asserted." He says this in the capacity of the referred radiographer or for that matter, of the dentist where he sees the patient for the first time.

The question raised by the essayist of the difficulty of diagnosing a blind abscess with but little destruction of hard tissue is of great importance. Just as the expert microscopist becomes more adept at tissue reading with every increasing study of specimens, does the dentist increase his ability to correctly interpretate by continued study of negatives. In cases of difficult diagnosis of this nature, it has seemed advisable at times to keep the negative under constant observation for a couple of days. After picking up such a negative and observing it for the twentieth or fortieth time sutle factors in the tissue will often manifest themselves suddenly and thus clear up the diagnosis. In this respect a powerful magnifying glass is often of value. The case cited to show that a film would overlook an abscess in a bicuspid where the original acute trouble is in the molar could never apply to a good diagnostician.

The assayist has very kindly seen fit to draw attention to some of my specimens of bone reconstruction, but questions the proof of the tissue being free from pathogenic germs. His question might be answered by the question, why does not all post operative Roentgenograms show newly constructed bone? If

the operation was such as sufficed to remove every particle of pathologic tissue in the peri-apical space, and the peri-apical end of the root opening securely covered by a non-irritating aseptic filling material, where would a new pathogenic germ come from and where could it locate? These are the two essential factors necessary and where correctly applied reinfection is impossible. Whenever a root filling does not pass thru the end of the root so as to cover the outside of the foramin it renders that point a seductive point of habitation for any ambitious micro-organism. On the other hand nothing is more easily destructive of tissue than forcing thru the foramin of root fillings of some irritating substance; oxychloride of zinc cement and filling materials containing formalin in the smallest quantity are specially productive of tissue destruction.

An important point for interpretation is pulp nodules. The properly prepared film shows these with great clearness, but like many other points must be left for some other occasion.

R. Ottolengui, D. D. S., New York City, N. Y.

There is so much in this paper with which I heartily agree that I trust the essayist will be satisfied with this statement and will forgive me if I discuss only those parts with which I disagree. I can agree also with almost all Dr. Rhein has said. There is something, however, in both the essay and the discussion with which I am in such violent discord that I must ask your patience to get it out of my system before I come directly to the subject of the reading of radiographs. I am going to try to drive a nail in the coffin of that word "Roentgenogram." I would like to see that buried forever. I know very well that the Roentgen Society has recently adopted that terminology, but I need go back only to the essay of this afternoon to show the foolishness of it, because in one place the author says "Roentgenogram" and in another "radiograph," and in science we know that the fewer terms we have for the same idea, the better. These gentlemen have said "Roentgenogram" because the Roentgen Society tells them to say so. Why should the Roentgen Society use this term? Because they wish to connect this man's name permanently with this science, because they wish to erect a monument to him in the language. That is not the purpose of a language. We have places where we can put up stone buildings for monuments. Go back to the beginning of electricity. Franklin was the first man who called our attention to the fact that we could make use of it, but we do not speak of Franklinology, and still we have not forgotten Franklin. Fulton first showed us how to run a boat with steam, but we do not call steam navigation Fultonology, nor do we forget Fulton. We name streets after him. I am willing they should build a whole town in Germany and call it Roentgenville, but I am opposed to building a monument to this man in our language, and especially to use a word that is so difficult to pronounce by anybody except those of German extraction (Laughter). No body of scientists has any right to interfere with the rights of any other body of scientists, and before the X-ray was discovered, before the Roentgen Society was formed, before anybody in that society was born, before Roentgen was born, we had the science of etymology and we had philology. The etymologist is the one to trace to formal rules the proper construction of words introduced into one language from another. The philologist is a man who endeavors to make language euphonious and correct by having a set of terms constructed in some order, so that the terminology will have some correlation with its structural form. Let us see what these men have done. We have the word "telegraph," from "telon," far off, and "graph," to

write. When the wireless telegraph came in, we were at a loss for a word, and for a long time they called those messages wireless messages. Later, and fortunately, the term "radiogram" not having been preempted, it has been taken and is now being used for the message sent by these electric waves, so that the radiogram is something written by the ray, using "gram" in the participial form. "Photograph" from "photos," light, and "graphs," to write, writing with light. And "radiograph" is a beautiful collateral word, writing with the ray, and especially so as we use this photographic process to do it. "Phonograph," writing with sound; "Stenograph," written in short words, and a number of other words which are all collateral in construction, and whose meanings can be definitely determined by that construction. In addition to that, to have the adjectives and nouns that go with them all easily differentiated. We have photograph, photography and photographer; radiograph, radiography and radiographer. In addition to that we have the word "radiology," and here "radiology," as distinguished from "radiography," is the science which deals with the entire use of the ray, including the therapy as well as the radiography. In other words, radiograph would be a branch of radiology. I hope I have the grave deep enough so that the sexton will be able to bury that word and plant flowers over it. We must keep it out of our dental literature (Applause).

I want to agree with Dr. Rhein, and disagree with the essayist, in the matter of the use of plates. In order to do that I want you to consider another statement he made, and which is made by a number of radiographers, and that is that these radiographs are records of varying densities. That is in a certain sense true, but I do not like the word "density." What it really is, is a record of varying resistance to the ray, and resistance to the ray is not always density. The trouble about the word "density" is that to one mind it carries the idea of atomic weight, and to another it carries the idea of hardness. In the first uses of the X-ray, a common experiment was to put a person's hand on the table, put a book over it, and cast the ray thru it. You could put a dictionary over that hand that would weigh ten pounds, and that would not have any great density in the sense of hardness, and get a perfect picture of the hand. But put a thin sheet of lead over it, which was only one pound in weight, and which had a greater density in the sense of hardness, and you wouldn't get any picture at all. So in the last analysis, your radiograph is a record of varying resistance to the ray. Apply that to this specific thought. What do we want in these dental radiographs around tooth roots? We are not anxious to get the profile of those roots. We know or can guess how many roots the tooth has. Sometimes we may want to know the length. But because of the fact you have taken the teeth in two jaws, you never get the identical length of the tooth; you always have some distortion. You do not always have distortion in the film; that will depend on the anatomy of the parts and skill of the operator, and we will have radiographs sufficiently skilled to give the exact measurement of teeth from radiographs. But what we want it for is to study the disease in that tissue, and that depends on the nature of the bond surrounding these parts, the presence or absence of the bone mesh and the condition of that cancellous structure. If you take a picture of a skull from which all the soft tissue has been removed, you get a well defined reticulation of the bone. That proves that in life the presence of this tissue, altho of very little density and of very little atomic weight, does interfere with the transmission of the ray, and does blur your picture; hence

the less soft tissue there is between the parts you wish to read and the plate, the better. When you place a film at the lingual side of the tooth, and especially is this true in the lower arch, you have nothing but a very thin layer of gum interposed between your plate and the bone of which you wish a record. When you use a plate, you have all of that and all of the cheek tissue besides, and that is the reason why there never was as good detail, in a plate picture made by the best man with the best processes, as compared with the film, made by the best man under the best conditions (Applause).

Elmer S. Best, D. D. S., Minneapolis, Minn.

I first want to commend the essayist upon the work he has done in standardizing this particular field of work. I have learned much from the essayist in establishing this work upon a really scientific basis in making an examination such as we are soon going to be called upon to make, of the entire jaws, upper and lower, for the physicians and surgeons, in endeavoring to locate the cause of certain systemic troubles which they believe have their origin in the jaws. The great difficulty I have experienced in making a complete examination without the use of plates, of all the conditions of all the lower and upper jaws, is in the great number of small films which it seems necessary for us to use, and also the over lapping of one film with another, and when you do not have the patient there to check up your examination, the possibility of confusing the teeth on the right side with those on the left side. I therefore say again, I want to compliment the essayist. If he has not done anything else, he has given us something of great importance, when, with four exposures, he can give us all the teeth and the adjacent parts on the left side forward to the cuspid and on the right side forward to the cuspid, and then with the film of the upper and lower anterior teeth, he has disclosed to us the entire field we wish to investigate. You can then if you wish, check up those findings by taking an exposure of the part which you suspect.

I also agree with him that it is almost impossible to locate definitely with a radiograph those cases where we have putrescent pulp tissue with no bony destruction.

There are certain objections we have to the use of plates, aside from some of the objections which have been mentioned, and that is that possibly we do not get the same detail in the plate which you get in a film; yet I must say that I have seen some plates taken by the essayist which contain just as fine and minute details as I have ever seen. Another objection we have to the plates is that it is rather difficult and uncertain in handling them. If you should accidentally drop a plate, it is likely to break, and your record of that case is gone, if you cannot get another. I believe the Eastman Kodak Co. will supply us, in almost the immediate future, with a film of almost any size we may desire, whereby we can get practically the same image we can with a plate. That will help tremendously.

Dr. Rhein brought up an important question when he mentioned the importance of having a man thoroly versed in the knowledge of anatomy of the teeth and jaws doing this work and making the interpretation. This is distinctly a dentist's field.

In examining a great many cases where there is defective root canal filling, we have found conditions which are enough to make any man in the practise of dentistry thoroly ashamed of what he has been accomplishing. These people, on account of not having a manifestation of their trouble in the mouth, are not going to return to their dentist to have their trouble eliminated; they are going to their family physician, and what is

he going to do? Being unable to locate the cause of this trouble, which has a systematic manifestation, he is doing as a great many of them are doing now, having the jaws radiographed, and what are they going to find, when I tell you that at least 90 per cent of all the root canal work we have been doing in the past is defective and that a large per cent of your work is causing trouble? And yet the men who did the work do not believe it is causing trouble. What is our position going to be when these patients come back to us with their physicians showing the entire jaws radiographed, and where we have in one, two, three or four cases performed an operation which has resulted in damage to that patient's health? We must therefore consider the operation of root canal filling as one of major importance, and the only way in which we can intelligently do it, with any degree of credit to ourselves is by the continued use of the radiograph.

DR. F. W. LOWE, of Buffalo, N. Y.

I feel inclined to be convinced that all the discussers are right. You are not allowed to depend upon the radiographer, or upon yourself; you are not allowed to depend upon the plate, and not upon the film. I don't see what you can do but pull out all the teeth. I want to tell a little story to show we must have both the film and the plate. I have seen a fistula well down upon the neck, and all the swelling that showed was well under the jaw, well under the rim. An accident to the jaw two or more years before, the fistula and swelling made their appearance had occurred, and things had been cleaned up, and the man was supposed to have spit out all the teeth knocked loose. When these later manifestations occurred and the physician and surgeon consulted, they opined it couldn't have been anything attributable to the teeth, because the teeth appeared to be normal. However, a film was taken, and nothing showed except a little apparent density just at the edge of the lower jaw. Then the radiographer put the patient on his head and took another picture from below up, and we found that as the result of that accident, a tooth had been broken off above the neck, leaving the entire root in, and that it had turned a somersault so that the big end of the root was downward, and it was just at that rim of the jaw. The small film showed nothing; the first large plate taken from the outside showed nothing, except that very slight density, but the picture taken from underneath the jaw showed that tooth in perfect contour. We cannot take too many pictures. When a fellow is 63 years old, as I am, he can not begin to do his own radiography; he won't live long enough to become expert. There is only one solution; you must rent a house, find an expert radiographer, a general one, a good one, and then plant him right under your office. I am going to take Dr. Eisen home with me, and am going to have a radiographer (Laughter).

DR. W. A. GIFFEN, Detroit, Mich.

We get better detail and less distortion in a radiograph made on a dental film than from a plate, for this reason, that we can get closer to the focal point.

The Eastman Kodak Co. are now making films of various sizes. I have been using 8x10 films for fractures and other cases where there was more or less swelling, and they work out nicely. By placing the patient's head on a soft pillow, you get adaptation as close to the bone as possible by compressing the tissues between the bone and the film. This method certainly minimizes the distortion.

Regarding the statement that the general radiographer is unable to correctly diagnose many of the lesions we have to contend with, I believe the reasons are because as a rule he is not so familiar with the practise of obtaining the

clinical history of those cases, and does not recognize the differences in the anatomical positions of the teeth in the various shaped dental arches. I think the more successful way would be for each practitioner to do his own radiography. We do find conditions to be very bad occasionally under crowns and bridges, but I do not feel that the dentists are so much to blame because they have not had knowledge in the past that has been gained in the last few months or years.

It would be splendid if some one could devise a perfect root canal filling which would meet the requirements of the profession, in which there could be incorporated an insoluble salt that would be impervious to the ray. It would then be possible to diagnose whether a hair line on very minute canal was filled to the apex with filling material or with "hot air." It would enable us to depend more completely on the radiograph.

I believe the matter of the root canal filling is very important, and is something that should be taken up by a committee of men qualified to pass upon this question to the satisfaction of the dental profession. In fact this is one of the first questions to be worked out by the research committee of the National Dental Association. (Applause).

DR. M. N. FEDERSPIEL, Milwaukee, Wis.

I would like to have some one tell me how it is possible to differentiate a root granaloma from a dental cyst—personally I believe that it is impossible to do so with the X-ray.

DR. H. J. KAUFFER, of New York City.

Too often we are satisfied with a clinical diagnosis, and when the film agrees with that clinical diagnosis, an operation is performed in that particular part, whereas there are obscure conditions that may be found upon the plate. I have in mind the case of an apical abscess of the lateral tooth, of which a plate was taken, and disclosed an apical abscess of the second molar, which was draining into the antrum. That abscess would be entirely lost from general dental observation, and it was really more essential to be taken care of and eradicated than the abscess. The film of course is well as a secondary precaution, after we have made a diagnosis, to get a more definite radiograph of a circumscribed area.

DR. R. OTTOLENGUI: I do not want the essayist to think I was attacking the usefulness of the full plate radiograph. I was only combating the argument for the exclusive use of the full plate radiograph. I once acted as consultant in an orthodontic case in a distant city, and I recommended a certain orthodontist in that city. The mother occasionally visited New York, and she would bring the child to see me. In the course of the procedure it became necessary to determine the presence or absence of a left lower second bicuspid. At the completion of the case the mother came in with this peculiar story, she said that the first radiograph showed that the tooth was present, and a space was opened in the arch for this tooth. They waited for it to erupt, and at the end of a year another radiograph was taken to see the progress of the eruption, and lo the tooth was not there. Now the solution of that was simple. We needed a full plate picture to show where that tooth had drifted. The first picture definitely showed that a bicuspid was present in that bone; the second picture only showed that there was no bicuspid in the field covered by the film, and it was a wrong reading to say that the tooth was absent because it did not show on a small film. Not having seen either of these pictures, I was convinced that these two films were records of different areas, and hence, as a year had passed, that there might have been some migration. I did not know whether I would find it at the

surface or up at the top of the skull (Laughter). We obtained a full plate and it was lying under the first molar. It was lying horizontally, and there is no doubt in my mind that it moved distally as it developed, and that is why it showed in the first picture and not in the second.

I precipitate myself into this discussion to say that I do appreciate the value of the big plate, and also to tell why I am opposed to its primary use in connection with dental work. It has been said here today, and very truly, that the radiographers have done wonders. They have brought home to us our disgraceful root canal technique, and, then preach thru one of our lines of literature that the physician must consider the mouth in making his diagnosis. We must not be surprised if he goes to his medical radiographer, and if he finds a lot of these little shadows, indicating blind abscesses, he has a right to say the dental work is at fault. There is but one remedy. We must reconstruct our technique, so that when these cases come to these medical men, they will not find those defects, and we cannot do that without the constant use of the radiograph to check up our root technique. We cannot apply that in general practise unless we can bring the cost of it within the reach of the multitude. Here is the advantage of the small film and of the dentist doing his own work. In the first place, if that is all the dentist wants to know, that his root work is right, he can install a very inexpensive apparatus.

You may not get films good enough for reproduction on the screen but they will tell him how far the root canal filling has gone, at moderate cost, without any such elaborate apparatus as we have seen, and without the necessity of sending the patient out. The cost of sending the patient to the specialist in radiography prohibits his getting the picture after the work is done. These men have no records of the results after treatment. With the outfit installed in your office, you can take pictures, whether you need them or not, and you can get a number of pictures, which you cannot get if you send the patient out.

DR. RHEIN: The main point in the essayist's very valuable production, is the discriminating detail of the different tissue for diagnostic purposes. A picture of the entire head or mouth may be a very pretty adjunct to have, but it's value as compared with the well focused film is not very great. When it is desirable to discriminate between healthy and unhealthy tissue in any particular field, more so when it is important to intelligently read the nature of the abnormal condition, the glass plate has very little value along side of a well focussed film. In modern scientific root canal therapy, it is imperative that every step of the treatment be checked by a correct Roentgenogram, even to a picture when the operation is finally concluded. The inordinate benefit obtained in this way is appreciated by every operator who has utilized the X-ray in this way. The glass plate will never satisfy the operator who has once used the film for this purpose.

DR. E. J. EISEN: I won't say anything further than to thank you, ladies and gentlemen, and those of you who have so kindly discust the paper. (Applause.)

THE RESPONSIBILITIES OF THE STATE SOCIETY OFFICERS.

By Homer C. Brown, D. D. S., Columbus, Ohio.

(Read before the State Society Officers' Section, National Dental Association, Rochester, N. Y., July 8th, 1914.)

IT WAS only at the urgent solicitation of the officers of this section that I consented to present a paper on this occasion. This could more appropriately have been contributed by another, but it was argued that my varied official experience would qualify me to present some points worthy of consideration to those interested in this section. In this way my consent was secured, as it was generally understood that I would have no other particular duties to perform at this meeting.

The subject was selected with a view of stimulating, if that be necessary, the officers of the various state dental societies to recognize and assume their full responsibilities. This is especially emphasized at this particular time, when it is so very important to have every such society, with its full membership, affiliated with the National Dental Association as a constituent.

It has always been more or less discouraging to note the lethargetic tendency of so many members of our profession in doing some service that does not render, at any particular time, some positive financial remuneration. Unfortunately this has been a distinct handicap in our progress and it also has been somewhat discouraging when attempting to transact official business with the officers of some of our state societies. In view of this, if I can say anything that will tend to develop a more efficient corps of officers for these societies I will feel that my efforts have been worth while. Under our present plan of organization the need of this increased efficiency is especially desirable.

We are confident that under favorable conditions the reorganized National Dental Association is going to prove a far greater success than even its most loyal supporters anticipated, but it must be distinctly understood that the individual member is the primary unit of its strength. Where component or district societies make up the state organization they become the next step, while in other instances the state society becomes the second step. Be that as it may, the future of the National will depend upon the co-operation of its constituents, the state dental societies, and the success of these, in this new relation, will very largely depend upon the officers who serve their respective societies during the next few years.

For that reason, we earnestly appeal to those who have been or will be thus honored, to assume and discharge their official duties with the same interest and devotion that prompts them to safeguard their personal affairs. To do other than this will not be just to themselves or prove them worthy of the confidence placed in them by their associates. We are further confident that if the state society officers become sufficiently interested in this new relation, it will result

in a harmonious co-operation, as well as an increased membership in the state and component societies. This will be true just as soon as this relationship is fully understood and especially when our National Dental Journal is published. Then membership in these organizations will mean more than heretofore and will be proportionately sought and appreciated.

In some states the profession is better organized than in others and this is largely due to the officers and committees of such societies. Under ordinary circumstances what is possible in one section of the country can, in a modified way, be accomplished in another. Oklahoma and North Dakota have in a very brief time organized very effective societies and have secured the co-operation of a large per cent of the legal pratitioners in their respective states. This has been accomplished under unfavorable transportation facilities and it would seem that some of the more populous states could afford to investigate their methods. I was particularly interested in the efforts of the officers of the North Dakota Society in stimulating an interest in their last meeting. Their secretary was kind enough to send me a copy of their program, one of their circular letters and a unique but dignified post card which I herewith incorporate:

N[o]rth D[entist]akota S[hould]tate D[ecline]ental A[ttending]ssociation

Grand Forks, Friday and Saturday

May 22 and 23

This was in two colors, the N. D. S. D. A. and the date of meeting in red, the other in black.

The success of any commercial enterprise very largely depends upon the active officers responsible for its management and this is true with organizations such as ours. In a commercial organization, the officers actively interested are usually paid salaries commensurate with their positions and abilities and therefore they are expected to give the interests of their concern first consideration. A dental society can in no sense be considered as having been organized for financial profit and it seldom occurs that any attempt is made to compensate any of its officers. For that reason those actively in charge, such as the officers and committees, must necessarily make many sacrifices in order to develop their society so that best results may be accomplished.

As a general rule, only those who have rendered efficient service in minor positions should be elected or appointed to the more responsible positions. The fact that a dentist may be recognized by his conferers as prominent in his profession, in his city, section or state, should not necessarily qualify him for active official duties of a responsible nature. He may not have any particular qualification or liking for organization work, may not possess any iniative and may not be willing to make the necessary sacrifices.

Therefore, I frankly say that no member should be elected to a responsible office in the state society, and this applies alike to all others, unless he possesses some degree of qualification for the position. This should be supplemented with a deep interest in the affairs of the particular society, as well as what applies to the progress of the profession generally. Further, he should also be willing to make the necessary sacrifice of time, energy and money in order to make his official term a successful one.

No officer or committeeman, elected or appointed, should assume autocratic power or more responsibility than rightfully belongs to his position. I do not mean by this that a person in a responsible position should always wait to be told just what to do or neglect matters for lack of some definite instruction. Acts of omission are equally if not more censurable than acts of commission.

That is, inactivity or lack or effort is open to as much or more criticism than an honest effort to do what the official thinks to be for the best interests of the organization he represents. Either may result in mistakes, but the official who makes a mistake trying to do something should be less criticised than one who makes no effort to accomplish anything. The person who never makes a mistake or never makes an enemy probably will never do much that can be considered of any special value.

It is always advisable to be considerate of the interests of others and this is especially true in our dental organizations. Officers and committeemen, serving in responsible positions, should consult freely with those having an equal interest in the success of the society, as well as take into consideration the wishes of those in the ranks who made it possible for them to hold official positions.

Many of our members are perfectly willing to permit others to do all the work and receive all the credit, when success crowns their efforts. When the reverse is true they are equally willing that the workers should receive all the criticism. My contention is that in success there is ample credit for all and it is especially desirable that this should be generously distributed, since it is hardly possible to conduct a successful meeting without the loyal co-operation of many assistants. To be liberal and to encourage others, we should go back far enough to take in every member of the organization, since without them little could have been accomplished.

The offices of the president and secretary are the two most important in a state dental society. The continued success of a society depends even more upon the secretary than the president, as it is more or less customary to re-elect a good secretary from time to time and in this manner he becomes quite familiar with the affairs of the organization and is naturally the bureau of information for the members and others.

Most societies have a Board of Trustees, or executive council, or some similar business body which very largely regulates the business affairs. Their terms of office expire at irregular periods and this is a very desirable feature, as it tends to maintain the continuation of established policies instead of having too frequent and too drastic changes. It is not usually a good policy for these boards of control to waive too many of their prescribed duties in favor of newly elected officers, altho it is only natural that a new president should have some individual ideas as to how to best make his administration a success and due deference, within reasonable limits, should be shown him. This frequently produces enough change from year to year to safeguard against too much of a sameness and makes possible the development of individual features that become attractive.

One instance might be cited in way of illustration. The Ohio State Dental Society at its meeting last December, set aside one evening for what was termed a "Health and Science Conference." A diversified program was presented on this occasion, which proved very interesting and instructive. This is herewith incorporated in order to show the features presented:

HEALTH AND SCIENCE CONFERENCE.

6:00 P. M. Reception to guests. (Informal.)

7:00 P. M. Dinner.

8:00 P. M. Addresses.

President, Dr. Weston A. Price, presiding.

Greetings from the National Dental Association, President, Dr. Homer C. Brown.

The State and Dental Science, How

Each Can Help the Other, Governor James M. Cox.

How Dental Infections Reach Other Organs and Tissues, Dr. Victor C. Vaughn, President-elect of the American Medical Association.

Exact Knowledge and How it is Obtained, Dr. Edward C. Kirk, Dean and Editor.

The Relation of Dentistry to the Health of the People, Dr. E. F. McCampbell, Secretary Ohio State Board of Health.

The members of the Ohio State Board of Health and three members of the technical staff; the president-elect and the secretary of the Ohio State Medical Society and the news editor of their Journal, as well as several prominent physicians and laymen, were present upon investigation. This conference was stimulating to the dentists present and made a favorable impression with the invited guests.

Such a program will be a strong factor in bringing about a closer co-operation between the dental and medical professions and the interests that should be working in harmony. This feature has already been productive of much good. In addition to the interests heretofore mentioned it would be advisable to invite representatives of the educational forces, as well as representatives of the press. This will give all of these varied interests an opportunity to observe the progress that the dental profession has made and will undoubtedly give the representatives of the press a better understanding of our profession. In this way we will probably receive more favorable consideration from them in the way of properly directed and dignified publicity.

Do not understand that I wish to be too critical of the press, since it is fully appreciated that they are not wholly responsible for much of the unfavorable publicity that we see from time to time. They do not always receive the consideration due them in their efforts to secure correct information and in that way the profession is more or less responsible, and this rests more with the officers of a state society than with the individual members. The officers are the ones usually interviewed and it is important that they show due consideration to the representatives of the press and assist them, to the end that only dignified educational publicity results therefrom. A word of caution to the members may be in order, as they should not be too critical if the name of an officer or committeeman should appear in the press in connection with some phase of our work. If the press is not permitted to use their own ideas in presenting the news to the public, they become more or less disinterested and the result is unsatisfactory publicity.

We all must appreciate the influence of the combined forces heretofore mentioned, in moulding public opinion and it is very important to have our position clearly understood and to have it known that we are endeavoring in every possible way to advance our profession, which in its final analysis means better service for the laity. Then, our interest in an educational campaign will be better understood and appreciated. The medical and dental professions will have rendered their best service when they have developed an increased interest in prevention rather than cure. I am convinced that the time is not far distant when both will be held responsible for the presence and prevalence of many preventable diseases.

Illinois, Indiana, Michigan and possibly other societies, arranged similar programs for one evening at their last meetings and they have all been well pleased with the results. We believe that a society with a reasonably good membership and attendance can very profitably set aside one evening for such a meeting. This need not necessarily be an

expensive arrangement since a dinner can be provided at a nominal cost, which need not exceed what the individual member would probably pay for a meal.

The newly elected officers of a state society should get together as soon as possible after election and discuss a general policy for the year. Outline your plans so that you will work in harmony and not expend unnecessary energy or duplicate work which leads to more or less confusion. In state societies composed of component or district societies it will be of advantage for the president to attend as many such meetings as he can and delegate other officials when it is inconvenient for him to be present. This may bring about an increased interest where conditions are far from ideal.

In selecting committees and arranging program details, all sections of the state should be given careful consideration, but it is of primary importance to ever bear in mind that qualifications for the duty assigned is the first requisite. The officers and committees are naturally responsible for the class of program presented and it will be in keeping with our progress to raise the standard of your program as fast as conditions will justify, but remember that in most societies there is a certain per cent of members whose interest may not be secured if the entire program is too scientific or technical. My suggestion would be to combine the scientific and practical and in this way interest may be better maintained and it will be possible to work up the scientific part of the program from year to year and have a stimulated co-operation among your members that could not be secured if the practical phase is too suddenly or entirely eliminated.

There are two extremes in preparing a program for a state society. One is that of depending wholly upon securing the essayists from other states and the other is where a society depends entirely upon its own membership. We appreciate the fact that the arrangement of program details is a matter of local concern, but I am of the opinion that the best interest will be served, generally speaking, if the major portion of the program is contributed by your own members. Then, supplement this with the highest type essayists that you can secure, regardless of location. In addition to this, and in order to stimulate a closer co-operation with the medical profession, it is recommended that at least one physician be invited to present some subject of mutual interest.

The plan adopted by a number of societies in presenting what they term a "Post Graduate Course," at their annual meetings, is a commendable one and from reports where such courses have been conducted is would seem that these have stimulated an increased interest in the profession and undoubtedly have been of positive benefit to the individual member.

The "Progressive Clinic" is a recent feature and is to be highly commended, but when possible it would seem advisable to have the clinical program divided into two sections, progressive and general, similar to that arranged for this meeting. My reason for suggesting this, as well as for the utilization of local men as contributors to your program, is that all of this will tend to develop clinicians and essayists and this feature should not be neglected.

There is another phase of our meetings which should receive careful consideration and that is the question of securing and maintaining the co-operation of exhibitors. In my opinion a good exhibit is one of the attractive features of our meetings and affords an opportunity for members from smaller localities to observe the improvement from year to year, in equipment, instruments, supplies, etc. In my experience with various

meetings I have usually found the exhibitors anxious to co-operate and very distinctly recall the personal interest taken by several representatives of different firms in assisting in developing an increased interest in the Ohio State Society when a good word from these men counted for much. I am quite certain that the exhibitors are willing to assume their rightful position in connection with our meetings, which is a secondary one, and that they are further willing to contribute liberally for the privilege of exhibiting.

We all understand that indirectly the profession finally pays this expense, but even if this is so the member and non-member contribute alike. The receipts from exhibit space very materially aid in paying the necessary expense of our meetings and there is no question that a good exhibit is the controlling influence that prompts a certain per cent to attend meetings. The society and exhibitor can be of mutual benefit and their relations should be fully understood and appreciated. It is not a good policy to charge exhorbitant rates for space as this will certainly react. The value of such space to the exhibitor depends more or less upon the number in attendance as well as the general arrangements for holding sessions and the location of exhibits.

The success of our future dental meetings will depend upon the officers and committees giving due consideration to the points herein mentioned and I believe some of these can be advantageously combined. The one important thing, which I consider very essential, is that those selected as officers shall possess proper qualifications and shall only accept their promotion as an opportunity to serve their profession and at the same time render a service to humanity.

In conclusion, I quote from my address of yesterday, which would seem to be especially appropriate on this occasion: The maximum strength of our National Dental Association is wholly dependent upon the state societies as constituent members thereof, and in many instances this automatically reverts to the component societies of the state organizations. The development of this maximum strength makes possible the conserving of those professional ideals which are worthy of retention! the advancing of our standards in order to keep pace with healthy progress; the encouraging and supporting of officers, committees, and those who contribute to our programs, as well as those qualified to do scientific research work; the fostering of the fraternal spirit, and the broadening of the individual. All of these are things worth while and only made possible thru efficient and well managed organizations. You officers, more than all others, will be held responsible for the development of our National Association into a strictly representative, harmonious, co-operative and influential organization, which will make possible the advancement of our profession, thus assuring a more efficient service to afflicted humanity.

Discussions.

W. H. G. Logan, Chicago, Ill.

"The Responsibilities of The State Society Officers" is an important subject for this section to consider because more uniform progress in the profession can be made when similar influences are created in every section of the country. From observations taken in our State and from other dental association meetings, I have been led to believe that the President should be given a great deal of latitude in regard to the policy the Society should pursue during his year of office and then hold him and his personally appointed committeemen responsible for the results. If the President in the final analysis of the year's work is to be held by the members accountable

in the main for any degree of failure, what course to pursue to secure harmonious, intelligent progress is the one question of the many good ones presented in President Brown's paper that I shall endeavor to discuss.

The common custom of waiting five to seven months after the annual election before taking up the serious consideration of the plans for the ensuing annual meeting should be discontinued by the officers of every State Society, and the one way I know of that the President can be positive of his tenure of office being an orderly one and surely measure up to its present day opportunities in educating the public and each member of the Society in the influences that diseased conditions of the mouth, nose and throat have upon the individual's welfare and their relation to the community's health, and get the mind of the entire membership focused upon the most important dental problems of the year, is for the President, immediately upon assuming office, to review the proceedings of his association for the past six to ten years. You might ask "Of what value is this?" Our answer is, it probably depends largely upon the method of review. and the plan suggested is, in the first column place the year and the name of the city where the meeting was held—then in their natural order, the number of papers read on Operative and Prosthetic Dentistry, Pathology, Diagnosis, Therapeutics, Surgery and miscellaneous subjects, with the author's name appearing beneath each paper—the number of clinics, number of exhibitors and amount received from them—number of members in attendance—and the annual balance in the treasury.

A brief comparison of these tabulated facts will bring to the fore that certain phases of certain general subjects have been up for discussion almost annually, while other important questions of the same general subject have not been discust. The too frequent appearance of the same essayist can be avoided and the appropriate number and character of papers can be ascertained. The relation of attendance to the variation of programs is seen. However, the greatest benefit that comes to the officer who seriously studies the various acts of his association is the acquirement of what might be termed the "Dental Society Atmosphere" which, figuratively speaking, permeates his whole body and brain to a degree that he finds both his active and sub-conscious mind constantly at work to devise a plan for the literary, clinic and exhibit committees, with the result that even the minutest detail to be cared for during the year by every committeeman who has an interlocking duty with the President is positively clear.

This work should be completed by the President in the first month of his year. In the following sixty days a general conference should be held with the executive officers of the association and the various important committees for the adoption of the plans worked out or the modification of same as the conference body shall finally determine. The importance of this meeting which is held not later than nine months before the coming annual meeting is that it acquaints every active officer and committeeman with the plans for the year, and when we consider the fact that these various officers are residing in different sections of the State and furthermore that these men will attend their local society meetings during the early fall and winter and there have an opportunity to explain to the members of the component societies the plan of campaign for the year, enthusiasm and united action on the part of every component society thruout the State is the much desired result.

The most natural objection to this suggestion would be that perhaps it was ideal but the traveling expenses for the various officers and committeemen would

make it impossible for most associations —but this is not true providing the President figures out in a very definite way the probable expenses to carry out the plan as outlined, fixes the rate per foot the exhibitors' space is to rent for, the amount of money needed for the visiting essayists plus the normal expense of the average year as found in a study of the expenses of the various preceeding years. And, that this has worked out as here suggested, I wish to refer to the expenses of the Illinois State Dental Society for the last year. In the celebration of our association's fiftieth anniversary the general plan as here suggested was instituted and the original figures seemed to show that it would be possible to care for all of the expenses without drawing upon the treasury. When the year's work was over, the reports of the various committees showed that we had an attendance of between five and six thousand which was slightly beyond our anticipation. For the first time in our Society's experience we did away with having paid advertisements in all preliminary and final programs and without personal contributions of funds, we were able to finish the year with sufficient funds to care for all bills and leave a small increase balance in the hands of the State Treasurer.

In conclusion let it be recorded that this plan has not been presented as an ideal one or the only method by which excellent results may be secured, but is here outlined because it worked successfully under trying conditions on the occasion of the Illinois State Dental Society's meeting held in Chicago March 23 to 26, 1914.

A. O. Ross, M. S., D. D. S., Columbus, Ohio.

The Program Committee, should be congratulated for securing Dr. Brown to write a paper on "The Responsibilities of the State Society Officers." I know of no other man in our profession who is better qualified or suited to write on this subject. I say this advisedly, for I have known Dr. Brown, and have had him numbered with my friends for twenty-five years. While connected with the teaching force of the Ohio College of Dental Surgery, Dr. Brown was a student of that institution, he so imprest me with his earnestness and ability that it has been a great pleasure for me to watch his career, from student up thru various offices and boards, both local and state, until the very highest honor that the profession can bestow upon him, has been worthily bestowed, that of President of the National Dental Association, and in each instance I am pleased to note he has made good. I appreciate the paper the more because, when the writer says what an officer should do, it means when he was that officer he did it, it mattered not how much time or energy it required.

We have worked together and discust society affairs so much that naturally our ideas run in parallel lines, therefore there is not much for me to say, except that I heartily endorse this paper. The writer refers to the individual member, as the primary unit of association strength. I agree with him, and think that the great responsibility of any society or association officer is to stimulate as near as possible every unit up to its fullest efficiency. This naturally suggests the question, how shall this be done? I think by co-operation of the N. D. A. State and Local Dental Societies. The program should be varied, to suit the individual members, you might say like a well balanced menu, which has the proper proportions of Protein, Fats, and Carbohydrates, so that each unit of the society body may receive proper nourishment, which means development. In our city we have listened to scholarly sermons for years, and sit up in our pews, and slept peacefully, without making progress. But it was left for Billy

Sunday to come in with his base ball slang and say: "You Muts, wake up, get busy, shake hands with the other fellow and help do something." After seven weeks of the most outrageous abuse of the King's English, our city was awakened to a most unusual activity, which to me, is conclusive evidence that we are not all ready to sit and listen to a program which is entirely composed of the most scientific papers that it is possible to procure, while our profession is conceded to be an educated profession, we must not forget that some are young and are not ready for the meat. Prof. Gordy once said to me that our School curriculems should be arranged for the masses and not for the classes. Reasoning on this same line programs should have papers and clinics from the practical paper and clinic up to the very best scientific and technical paper that can be produced. I feel that the officers and committees have fallen short of their duty to the membership, if such a program is not presented.

Further, I believe it is to the best interest of a society to have the major portion of the program made up from the membership, in this way a society develops its own members, and the officers are responsible for their development. While I believe in calling in outside men, I would never place more than one, or at the furthest, two on the program. As to officers. No man has a right to accept an office in a society of any kind unless he is willing to put forth the very best that is in him, for the best interest and advancement of the organization which he represents. I agree with the writer, in that a man should have experience in filling minor offices in a society before he is elected to the Presidency or Secretaryship, in fact no organization should take a chance in electing anyone to either of these important offices, unless they have been tried and tested in minor positions, further if a man is found incompetent to fill a minor position he should not be advanced to a more responsible one simply because he is in line, and precedent has established this routine. We should always remember that the organization is larger than the man, and if the man does not feel the responsibility of the position to which he has been elected or appointed he should be dropt. I will take this opportunity to say something to the members who are negligent in answering letters. Programs of necessity are largely arranged thru correspondence and it is almost impossible to complete a program on time unless the members co-operate by answering all correspondence promptly. It is most exasperating to have a man accept a position on the program and then have to write him several times for his subject and get no reply, yet this same man expects the program to be out on time. When you feel like criticising the officers ask yourself if you have done your part, if you have not, how can you expect everything to be ready and on time. Let every member unite in responsibility and promptly help when called upon to do something.

Referring to the press, in my opinion, every society should have a press committee, whose duty should be to provide the press with correct information as to what the Society and profession are doing. As a profession we have not been liberal enough in giving out information. The public is calling for information and we should freely give it, and it is the special duty of the officers to see that it is properly and correctly given.

THE CONDUCT OF STATE SOCIETIES AND THEIR COMPONENTS IN PLANNING OF PROGRAMS.

By Arthur D. Black, A. M., M. D., D. D. S., Chicago.

(Read before State Society Officers' Section, National Dental Association, Rochester, N. Y., July, 1914.)

I WILL present two matters relative to the development of the work of our State and Local Societies, for your consideration. (1). The present state of unpreparedness of the dental profession to cope with the scientific problems which confront it, and what the Society may do for improvement. (2). Certain commercial features which have been injected into our Society work. I would like to impress the fact that these two are closely related, and very definitely in conflict.

A nation wide awakening of our people in the matter of oral hygiene has tremendously increased the demand for dental service; the almost universal recognition by physicians of the fact that the mouth is a part of the human mechanism, which the dental profession does not yet appreciate, has brought upon us much just criticism and a demand for better service—a service which, to be performed properly, requires knowledge which we do not possess. We are therefor confronted at the same time with an urgent call for more dentists and a positive demand for men with broader education. The number of graduates of our dental schools has only now about reached its normal number after seven years of reduced classes on account of advancement of entrance requirements in 1907. I believe, however, that I express the trend of opinion of those men who guide our dental school policies, that our schools are preparing to answer as promptly as possible the call for the new dentist of broader education, rather than that for the larger number. That the dental schools of this country must and will require a four year course, beginning within the next two or three years is, I think, an almost settled matter.

If the dental student needs, as a part of his preparation for practise, something which we did not receive in college and which we may not have learned since, we need this same thing also, and must get it largely thru our dental societies and our dental journals. What do we need most today? Anyone of us may promptly find the answer if he will but read a few articles which are concerned with the problems now most seriously confronting us. We are soon lost in the mist of histology, cell physiology, cell ferments, cell pathology, bacteriology, bacterial ferments, vaccines, anti-bodies, bacterins and serums, which pass before our eyes in a continually increasing confusion, and we realize that the teacher in the dental school, who years ago endeavored to interest us in some of those foolish, non-mechanical, undental things had a broader vision of our future needs than did we.

The dental profession can not successfully handle the problems now confronting it with the present type of dentist. We must develop both in our school and from among ourselves a new type. There must be a new dentistry, just the same as there has been in process of development a new medicine. The new dentist must be essentially and especially a man who thinks, whose principal service to his patient is mental, not mechanical. This man must also have a broader basis for his thinking than we have today.

An engineer would not undertake to build a bridge across a river with a knowledge of the existing conditions on one side only of the stream. A dentist has no right to apply treatment in his field—to his part of the human mechanism, without a knowledge of the possible effect of that treatment on other parts. We can no longer consider the mouth as a detached, isolated cavity, to be treated regardless of the rest of the system. We must know more thoroly the structures of the tissues with which we are immediately concerned, and as much as possible of the interdependence of these with others, more or less remote. We must understand all of these things as a basis for our service.

Today we are concerned with the part which the dental society may play in the metamorphosis which we must undergo. Without in any way belittling the work of our dental research workers, I would like to emphasize the fact that we are facing a problem which can not be worked out for us by someone else. While it may aid us, we can not develop the new type of dentist by subscribing to the research fund. It is ourselves—each one of us—that need this development. To cite a concrete example: if the members of the dental profession had studied, absorbed, assimilated and utilized what was published in the American System of Dentistry in 1886 on the physiological functions and pathological problems involved in the destructive diseases of the gingivae and peridental membrane, we would have today an entirely different operative and prosthetic dentistry from that which is practised. The same applies to our treatment of dental caries. I know of no man who has seriously studied the facts involved in the proposition of extension for prevention who does not believe in them as a proper scientific basis for practical cavity preparation. Notwithstanding the fact that these principals were about as clearly presented twenty years ago as they have been over and over again since, comparatively few men are really making practical and proper use of them today. And why? Because the dentist—not of the new type—has been satisfied with a knowledge gained from witnessing a few clinics, and possibly the hurried reading of a few articles. Those clinics may or may not have exemplified the principles involved. He did not go home to read and study these problems to become master of them.

And so it must be with the problems of today and tomorrow. A score of researchers and several million dollars cannot change the dental profession to a group of men who will seriously undertake to do their part in preserving and promoting health.

The dental society which does the most good in this development is the society which promotes those plans which tend to invite, induce or compel the largest number of members to study, to think, to write and discuss those closer and finer details which go to make up every problem which confronts us. It is the following out of these things to their last ramification which makes it possible for a man to have the basis for really efficient service.

It should be recognized at once that the larger the society, the less effective must its work be in developing the mass of its membership. Conversely, the smaller the society, the better opportunity for the development of each member. Therefore, we must look to the component of the State Society, to the city club, to the small group—to the study club. In these, a number of earnest men may lay out a course of study, they may take up a problem and learn what there is to be known about it. One night a month during a year by such a group will lay the foundation for future work by those men, both as a group and as individuals which should be far reaching, for if it serves to develop the habit of study, it

will also develop the ability of teaching in conversation, discussion and by essay.

In the Illinois State Society some years ago the writer was charged with the task of developing a Post-Graduate Study Course in our thirty component societies. This was undertaken on the following plan: first, there were established in public libraries conveniently located in the larger cities thruout the state uniform dental libraries, each consisting of twenty-four volumes of dental journals, covering a period of six years. All articles in these volumes were indexed on cards and classified. Several special committees were appointed, to each of which was assigned a separate subject. A list of all the articles on each subject in the twenty-four volumes was furnished to each committee. Each committee prepared a number of questions—usually twenty-five, on the subject assigned to it. Then the members of the committee read over the articles and set down under each question references to paragraphs where answers might be found. A list of questions and references on one subject was published each month in our Society Bulletin which was mailed to all of our members. This was the basis for the work to be undertaken by the component society and the individual member. Each month every member received a list of questions and references on a given subject. Each man had convenient access to a library containing all articles referred to. In addition to the established libraries, we had two sets of the same journals unbound which were used as a circulating library, single or several monthly members being sent out by mail on request.

This gave the component society the opportunity to use the material in several ways. A member might be asked to write a paper covering certain questions. Several might be assigned to discuss it. Or a number of men might be given one question each, and asked to bring a resume of answers found. Or there might be a quiz class. This plan presents many possibilities of development by making it easy for each man to do a comparatively small part in the beginning.

Another plan which has been developed during the past few years is the post-graduate lecture course, by which a few men give a series of lectures on selected subjects on three or four successive days. While this plan has distinct advantages over a scattered series of essays, it lacks the very important item of requiring the members of the Society to study, by drawing upon a few men—usually from outside the ranks of the society—to do all or most of the work. In some of these there has been more or less free discussion and they will doubtless interest a small percentage to the study point, but they do not carry the members far enough out into open alone where each man will undertake to do for himself—there is too much leaning on the lectures.

These courses should be generally carried into smaller than state meetings, so that the lecturers will come into closer contact with the men. Journal articles or text books, if available, should be assigned beforehand and as many as possible should be induced to do preliminary study. More of discussion should be incouraged.

Probably no single plan will do more to develop a large number of men than the encouragement by societies of the habit of writing and reporting accurate case histories. These should become a regular office routine in all cases and particularly those in which there is systematic involvement from the mouth. The preparation of carefully written statements of thoro examinations of the mouth will develop to a most surprising extent ones power of acute observation, accurate recording, logical thinking, and good judgment in treatment.

We have what has become known as "the round table" among some of our local societies. The members are ar-

ranged in groups of from ten to fifteen about a table for the discussion of a previously announced topic. Into this may be brought case histories, models for demonstration, books with marked paragraphs to be read, etc. This plan brings the men into close contact for a heart to heart talk, and has proven very popular in some sections.

One of the best plans of keeping our large membership interested has been the publication of our Monthly Bulletin. This was begun in January, 1905, and has been issued every month since, except June, July and August. This Bulletin contains announcements and reports of local society meetings, reports of State Society committees, and anything else of interest to members. No papers or discussions appear in it. It varies in size from four to eight or sixteen pages, occasionally even larger, and is sent to all members under second class postage. The total cost is little—on the average about fifteen dollars for printing, addressing and postage on two thousand copies of eight pages. This Bulletin is a monthly booster for all matters in which the Society is interested and has probably done as much as any other one thing toward maintaining the large membership of our Society. Several other societies are now publishing similar bulletins.

During recent years more than the usual number of commercial problems have been injected into the work of our societies to the detriment of their legitimate progress. Among those I wish to mention the man who, usually unsuccessful in the conduct of a practise, is offering himself to the profession by giving special courses. Generally, these men have not made a reputation at home which should entitle them to unbounded faith, confidence and remuneration elsewhere. They may be heralded by a friend, a respresentative, or even a manager, who suggests that the dentists of the town should get up a class and secure the services of this man. Or possibly the class is arranged by the direct solicitation of the lecturer or demonstrator himself. The dentist may be asked to sign some form of contract. He is to become rich over night, he is to be taught first of all how to curret the golden scales out of the patient's pockets—salesmanship. The main idea is that without study and with little effect he will become so smooth that he can make people think that he is giving a service he knows in his heart he can not. The real scientific information imparted, if there be any, is more or less incidental. I have been much surprised at learning of some of the men who have taken these courses.

The most contemptible man of this is the dentist who maintains a dental society membership and under the guise of a worker for professional advancement, entitled to the confidence and faith which we should give him, appears before a society as its guest, when in reality a secret financial contract exists between this man and some one interested in those things advocated by him in a paper or demonstration.

The dental society should control every feature of its activities and guard carefully against those things which tend to hinder the advancement of the highest professional ideals. Each state society should control absolutely every foot of exhibit demonstration and clinic space. There should be the sharpest possible scrutiny of all of these to keep elements of commercialism in their proper places. Just as strict rules should apply to the selection of men for clinics and demonstrations, as for exhibits. The exhibit is and should be one of the very important features of our dental meetings, and all of the better supply houses will heartily co-operate to make and keep exhibits clean.

We should come to realize that in all things, whether strictly business or professional, there is no higher or better ethics than square dealing and honesty.

Discussions.

Dr. L. M. Weaver, Philadelphia, Pa.

As the essayist has said—and this exonerates us for not being prepared to discuss this valuable paper—he has not submitted a copy to us for our consideration. I have had the greatest respect and honor for Dr. Black and his work in the organization of dental societies, and I am pleased that he is still carrying the work forward and is the live wire of instruction for those of us who need it. I would say that in Pennsylvania we have received valuable assistance from Dr. Black in his suggestions and have modified them to suit our requirements in organization, and I want to give Dr. Black due credit for what we have been able to accomplish. (Applause.)

Dr. M. M. Forbes, Atlanta, Ga.

Inasmuch as we were not enabled to read Dr. Black's paper, as Dr. Weaver says, it exonerates us. I would like to say this, as of everything else concerning Dr. Black's work and papers, they are well worthy of any consideration. Everything that he does, says or writes is worth while, and I am going back to Georgia and try to stimulate to some extent the officers of the Georgia State Dental Association in some of the work that he has told of today. After seeing what is being done by our research men, which proves to us and corroborates Dr. Black's statement that this is an era of new dentistry, we who have graduated previously must have some schooling after we leave college in order to practise this new dentistry, and we can get this thru our societies, the meetings and clinics. I want to thank Dr. Black for his excellent paper. I am only sorry that I did not have an opportunity to read it and study it, and I wish to thank him personally for the good service he has brought about. (Applause.)

Dr. Edward C. Mills, Columbus, Ohio.

The method of conducting State Societies has been gone over very thoroly, and also the matter touching upon the units of strength in state organizations. As chairman of the organization committee, I have done some little field work in Ohio during the past year, and have had experience in some sections of the state where few, if any, men have ever attended more than one or two sessions of the State Society. Before an organization was attempted an educational campaign was started, explaining our purpose and aims thru an initiatory letter in substance as follows:

Dear Doctor:—We expect the dentists of..... counties to organize a local dental society. A meeting of all the ethical dentists in this section will be called in the near future and we hope you will signify your willingness to co-operate in the work by replying on enclosed postal.

Organizations are being made thruout the state and in those counties which have local societies, where the men get together and talk over matters of mutual interest, both from a business and professional standpoint, there has been a decided improvement in conditions.

Some of these societies have for their object protection against people who think the world owes them a living; others for the advancement of good fellowship with an occasional dinner; others, scientific work; but most of them, a combination of these.

The plan on which the work is being carried on is as follows: All local societies to be made component parts of the State Society. The local society is the representative of the State Society in that district and a practitioner becomes a member of the latter only by being elected a member of the former. The entire membership of the State Society is thus composed of the membership of the local societies; each member to pay

dues covering membership in the Local, State and National Societies, to the local society; the Treasurer of which is to forward to the Secretary of the State Society the State and National Societies' shares of the dues paid by each member. For the portion of dues sent to the Secretary of the State Society a member is entitled to all the privileges of membership in the State and National meetings, receives monthly the Dental Summary and the Journal of the National Association to be published in the near future.

The State Society furnishes, at its own expense, an essayist or clinician from its own membership, once a year, to a Component Society, on some subject the latter may select.

By this plan, men of each local organization pass on the qualifications of applicants to their own, the State and the National Associations and a forfeiture of membership in the former causes him to be dropt in the others.

This plan is increasing the membership of the existing local societies, the number of Components, the membership in the State and National organizations and the effectiveness and power of all dental organizations.

In union there is strength and an opportunity for the dissemination of new thought and professional progress; also, for an united effort on matters of importance to the profession.

Our committee desires your co-operation. Please assist us by a prompt reply.

Yours very truly,

..... Chairman.

Little remained to be said in way of explanation as to the purposes of the meeting, after this notice, but it was not uncommon for the officers elect to inquire "What shall our duties be and how are we to conduct a dental society?" When you have organized a new society, you have planted there a tender plant—a plant that needs care and attention, if you expect it to develop into a unit of strength of the State organization. No State Society can afford to start a new society and then neglect it— to reorganize a society that has died is most difficult. Illinois State Society sends one clinician or essayist a year. In Ohio we have an understanding to that effect, but for the best interests of the cause we have been pursuing a more liberal policy, especially in some of our newly organized societies. One of these got three clinicians at its last meeting in June. That was the first meeting of the society since its organization in December. Why was that done? That society covered five counties in some of which the State Society had no representative. It was impossible for those men to come together oftener than twice a year. There were forty-seven eligible men in those counties, and when the society was organized we had seventeen men in attendance. There is a possibility there for representation not only as an organized constituent of the State society but also for effective action on legislative matters, and that is a factor that must not be overlooked when we speak of our organization. Such society must have the careful attention of the State society or it will not live. We will give them another meeting in the fall and a better one than they had last spring.

When this society was organized there were seventeen men present and there were only two men who knew any of the others present or living in those five counties. One of the advantages of these societies is to get men together and get them acquainted, and after a while the men will come to these conventions to see those whom they know whether they hear or see anything else.

There has been a plan suggested that our state society provides that a legislative committee be appointed in each component society. At present we have but one legislative committee of three members in the State society, and all the

work in legislative matters devolves upon that one committee. No matter how strong or how weak they are, these component societies will take pride in the fact that they are are doing their part to help in the advance which we are making.

Members of these legislative committees will feel the responsibility of bringing their section of the state into line on all matters of progress. They are personally acquainted with the representatives and senators of their section. They were boys together, used to swim in the same old swimming hole, and the friendships and associations of youth have become closer in the years of greater responsibilities. Alive to each other's interests, it is a mild request to ask their support of a bill for the promotion of their professional interests.

At present, it is up to the legislative committee of the State society to get acquainted with the legislators, timidly approach matters of legislation pertaining to dentistry, and in asking their support of a bill, they think you are trying to put something over on them, because the boys back home have not exprest themselves on the subject,—one man back home can do more with his representation than a hundred men on our present legislative committee, and we propose to try it out in Ohio this winter —so please watch results.

Last spring we went to a locality to form an organization. The interest was so luke warm that we felt our attempt would be a dismal failure. Before meeting any of the local men I called on the Senator of the district, who had an office there, and talked to him as tho acquainted with him thru his work at the Capitol. I said, "Now these men down here haven't the interest that they should have in the organization of a dental society, and I want you as a personal friend, and for the importance of the cause, to come to this meeting at three o'clock this afternoon, and give them a talk on the importance of organization, and what it means to have the men who represent them in Columbus know what their interests are." That gentlemen came down at the appointed hour, while the Constitution was being read for adoption. He gave a very interesting talk, after which he remained until the organization was completed, the papers read, and seemed greatly interested in the clinics. On leaving at close of the meeting he said: "This is one of the nicest meetings I have ever attended. These are representative men in this section, and their presence here indicates that they stand for the best interests of their profession, and I shall feel safe in supporting any legislative measure they indorse."

DR. C. R. E. KOCH, Chicago, Ill.

There can be no possible objection to every component society having a legislative committee, provided that committee works in subordination to and cooperation with the legislative committee of the state society. I think that unless there is solidarity there is great danger of some one in one section of the state going off with an idea and working it up without consulting the committee whose business it is to look after the general proposition, and in place of creating strength that would encourage weakness by bringing about confusion of ideas in place of concentration.

Several years ago the legislative committee of the Illinois State Dental Society had a proposition of this kind to handle. The legislative committee consisted of three men. A bill was introduced before the Senate and House which did not meet with a great deal of approbation on the part of the legislators, by reason of their lack of acquaintance with the subject matter. The legislative committee sent a letter to each of the 1700 members of the State society at that time, telling them, "You live in such and such an assembly district. Your

senator and your representatives are thus and so. Write a letter to each senator and to each of your members in the House telling them to support this measure. Enclosed find a postal card. Advise the legislative committee on it that you have done so. The time to do it is now." Inside of seventy-two hours the legislative committee had 1200 of those cards back from members reporting that they had complied with the request. The legislative committee went to Springfield, and were met there by a number of members of the legislature who said "For Heaven's sake, pull off your dogs. We will give you anything you want, but don't send us any more letters, because we don't want to spend our time in answering them." And our bill past (Laughter).

If there is a legislative committee in each component society, and every component society has a scheme of its own, it is clear that nothing worth while would be accomplished. I thank you. (Applause).

DR. BLACK: I was very glad that Dr. Mills presented the proposition of the management and encouragement of component societies, as I will have little to say on that subject. When we reorganized the Illinois State Dental Society in 1904, we jumped our membership in one year from 276 to 1250 and since then it has gradually increased until this year our Society has paid the dues of more than 1750 members into this Association. I would like to impress the fact especially upon those men who come from states which have recently organized, or are now considering the organization of their societies on this plan, that they have not before them a perfectly simple and easy problem, to keep all of these component organizations going along in nice and harmonious fashion. We have today 28 component societies in the State of Illinois. We organized the State into 30 districts in 1904, and the number has now been reduced by the consolidation of societies in places where that seemed best, but practically we have maintained now, during a period of ten years, the component organizations as formed in 1904.

The dues of our society were $5 before we reorganized. We proposed to drop them to $2, in order to get in the large membership which we wanted. Many members of the Society were very skeptical as to the future financial problems of our Society, but the result has been the same as it has been with every other society that has been reorganized, that once we were well organized, there was no trouble to get all the money we needed for every legitimate problem that was presented to our Society. There has been no time from that day to this when our Society has been seriously in need of funds; in fact, for some years we have had more than $5,000 out at interest, aside from paying the regular expenses of our Society.

Dr. Koch and Dr. Mills have spoken of some of the possibilities of such an organization. There is almost no limit. The basis, however, of all of the possibilities under any form of organization is that one thing Dr. Mills referred to, and that is, the establishment of a proper feeling of good fellowship among the men in each community thruout the state. When that is once done, there is absolutely no trouble to handle any other proper problem presented. In conclusion I want to say that I would not have you think from what was stated in my paper, that I think it advisable for a society to take up any one of these propositions which has for its main object the encouragement and development of every individual member of that society, to the exclusion of the present plans of conducting society programs.

The one thing which should be kept uppermost in the minds of the men in charge of the programs, is to nurse along the idea of individual study at every opportunity which presents, so that there

will be a gradual development to the end that more and more members will take up study problems. Committees which undertake this type of work expect to meet with a good deal of discouragement because of the difficulties involved, and they must feel encouraged if they are able to carry along problems of this kind and make any reasonable progress with them, because there is no more difficult proposition for the dental society, and yet to my mind none more important. I thank you very much. (Applause.)

THE THOMAS W. EVANS MUSEUM AND DENTAL INSTITUTE, PHILADELPHIA, PA.

THE RESEARCH DEPARTMENT.

CONDUCTED BY THE
SCIENTIFIC FOUNDATION AND RESEARCH COMMISSION
OF THE
NATIONAL DENTAL ASSOCIATION.

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THE THOMAS W. EVANS MUSEUM AND DENTAL INSTITUTE.

Weston A. Price, M. S., D. D. S.

THERE is nothing more vital to the interest of humanity than, what, for a better term, we are pleased to call a psychological moment. It is the crystalization of ideas into ideals and the putting into practical forms, to greatly influence and benefit humanity, those elements that, at one time, were simply visions in the mind of some individual or individuals. It is exceedingly significant and instructive that many great discoveries and inventions are made by different individuals within a few hours or weeks of each other, and yet no one knew of the other's work. Each, however, had the foundation of facts growing out of previous events and studies made by others and the forwarding step of the late Dr. Thomas W. Evans was just such a logical sequence.

The struggle of the ages has been for health and happiness and the last few decades have contributed more toward a consummation of that zealous search than all the centuries preceding. This is illustrated by the fact that the average span of human life today, where civilization is most advanced, is approximately fifty years, as against periods ranging from fifteen to thirty for the centuries preceding. One factor is chiefly responsible for this great change, namely, the establishment of truth and the elimination of error from the minds of men. Dr. Vaughan, President of the American Medical Association, states that the present life rate can be very considerably extended. He says: "In the middle ages the average life was less than twenty years. Now it is quite fifty years and it might easily be increased by fifteen years, if the people as a whole make strict application of the facts already demonstrated by studies in preventative medicine. Not only has life been lengthened by the efficiency of the individual but it has been multiplied,

and there seems to be no limit to the work that is possible in this direction."

The students, who are specializing by study in various branches of human welfare, seem, in the last few years, to come out from the dark fields of their exploration on to heights to which they have climbed thru their special researches, and each seems to have made the discovery that the oral cavity, with its multitude of direct and indirect relations to our bodily economy, is in a small or large part responsible for the embarrassments that are coming to the human unit from his particular viewpoint. Within a decade or two a score of challenges have been thrown to the guardians of the organs and tissues of the mouth, few of which can be answered as yet but there is every reason to believe they will be answered after adequate and competent investigation shall have been made.

It is not an accident that there should have been given to humanity and the dental profession the Thomas W. Evans Museum and Dental Institute for teaching and research. It is the logical sequence to mental and moral development as they relate to the great problems of human health and happiness, and it is only an index to other great unfoldings that will come from the hearts of the men serving in the healing professions and those in the laity equally devoted to the betterment of humanity. There is little doubt that the next decade or two will see many such munificent gifts to the dental profession and humanity as the splendid Thomas W. Evans Museum and Dental Institute for research and the Forsyth Dental Infirmary for children. These expressions of the unfolding of the human heart are only exceeded in significance by the large number of individual gifts, entailing as they do a real personal sacrifice, which are being given daily by the members of the dental profession from all over this country. They are giving until it hurts for the support of dental researches, because they are inspired by the same motive and the same confidence, namely, the love of truth and its reconstructing power. The question for the members of the dental profession to ask themselves, as they look upon this splendid institution, is "Am I a part of this great psychological moment?"

The members of the Scientific Foundation and Research Commission of the National Dental Association unite in the chorus of joy and appreciation that this splendid building has been made a reality, and we congratulate the profession that it has such a leader as Dr. Kirk, who, had he not had a vision and been a part of this great psychological moment, could not have put in so perfect concrete form this superb expression of human progress.

The problem of our profession is not only the securing of financial endowments but is also the development of men with vision—not visionary men—men who can see the logical sequence that must follow a series of facts. Let us hope that a great power may be given this institution to build men with a vision. It is only by the combination of these two qualities that the superhuman man can be achieved. That man, who thereby becoming a co-creater with God in the building of a civilization that has established health and happiness, is both divine and human, for truth is God and God is truth.

ORAL PROPHYLAXIS IN ITS RELATION TO PYORRHEA AND ITS TREATMENT.

The Work Relative to the Entamoeba in This Paper is the Product of the Research Commission of the National Dental Association.

By Arthur T. Henrici, M. D., and the Author of this Paper, Thomas B. Hartzell, M. D., D. D. S.

(Read before the Chicago Dental Society, April 20, 1915.)

PYORRHEA alveolaris begins in the gum margins. The writer of this article voiced this thought in a paper read before the Northeastern Dental Association in 1911.* Perhaps no more conclusive argument can be adduced on this point than the fact that every dentist has noticed that the removal of infected teeth results ninety-nine times out of a hundred in cessation of all inflammatory symptoms. The second corroborative fact is that removal of the infected porous root surface usually checks all types of interstitial gingivitis quickly if the work be accurately done, but if the tooth's surface be neglected and dirty, gingivitis recurs.

In the observation of more than two thousand cases, the author has found no exception to this general rule, except in cases of acute diffused nephritis, diabetes-mellitus, and certain types of drug poisoning. The above observation was published in the Canadian Dental Journal, June 5, 1912.

That gingival inflammation is the originating point from which pyorrhoeal inflammations continue has been observed by many writers. A close study of the pictures of transverse section of both human and animal jaws by Talbot, (*1) and human jaws by Hopewell Smith (*2) and Znamensky (*3) of the University of Moscow, all show the deepest inflammation in the gingivae and the masses of leucocytes progressively less as we recede from the gingival margin. This point seems to have been given little weight by Talbot and Smith in their efforts to determine the point of origin, they, becoming deeply interested in the changes going on in the deeper structures of the advanced case, while on the contrary, Znamensky emphasizes his belief that the gingival margin is the point of origin. (See lantern slides of Talbot (Fig. 1), Smith, (Fig. 2), and Znamensky (Fig. 3). Perhaps the most notable article in which a rather comprehensive series of observations has been accumulated is that of Doctor Arthur Black which was published in the Dental Cosmos, page 1219, year 1913. These observations were accumulated by a group of men who worked in conjunction with him and confirmed the view already stat-

*Published in the Dental Cosmos, 1911.

*1—Talbot—Interstitial Gingivitis.
*2—Smith—Dental Cosmos, 1911.
*3—Znamensky—British Dental Journal, 1908.

ed. In the observation and study of more than two thousand cases to date, the author has found no exception to this general rule, save those already mentioned.

Granted then that the gingival margins play an important role in this disease, our next question is, what is the explanation of this often observed fact?

Fig. 1.

Longitudinal section of tooth and gum tissue. Chronic interstitial gingivitis. Dog. A, Enamel; E, Epithelial tissue; G, Submucous membrane; H, Periosteum; K, Capillaries; V, Violent inflammation; AA, Point of union of epithelial tissue and peridental membrane; RR, Space pocket from want of union of epithelial fold.—*Talbot.*

Is it because the tissues of the gingivae are less well protected, or is it because the blood supply to the gingival margins is less generous than other areas in the oral cavity. or is it because the irritating agent accumulates on the tooth's surface and constantly flows under the gingivae? Has systematic oral prophylaxis taught us anything upon which we may depend regarding this matter? Certainly there must be a rational explanation for the fact that inflammation of the gingival margin invariably precedes deeper infection of the tissues in the neighborhood of the human teeth. What, therefore, is that explanation? The author believes the bacterial masses on the tooth surface furnish the chief irritant and the imperfectly protected gum margin permits the irritant to enter the tissues, the

Fig. 2.

A, Free edge of cementum; B, Oral epithelium of gum tissue. Above A is a shallow pocket filled with pus during life.—*Smith.*

blood supply being received from end capillaries the return flow is blocked by swelling, thus creating a favorable field for bacterial invasion. We find the lingual surfaces of the lower central incisors are particularly subject to the accumulation of salivary calculus and it has been the experience of every observing dentist that we have recession of bone and gum on the lingual surfaces of these teeth, accompanied by a comparatively slight inflammatory disturbance with no macroscopic evidence of pus, just a low grade gingivitis. It is also

true that gingival inflammation and loss of bone does not occur on the gum margins of patients who have consistently practised oral prophylaxis on the tooth surfaces, so that the tooth surfaces are free from bacterial and mechanical irritants.

That we may more clearly correlate these two facts, namely, that clean tooth surfaces and hard gums prevent gingival inflammation, the author invites your attention first to a study of a series of stained tooth surfaces in mouths in which no especial care had been taken of the tooth surfaces in the gingival neighborhood, but in which the teeth to the casual observer seemed to be clean.

Fig. 3. Fig. 3 A.

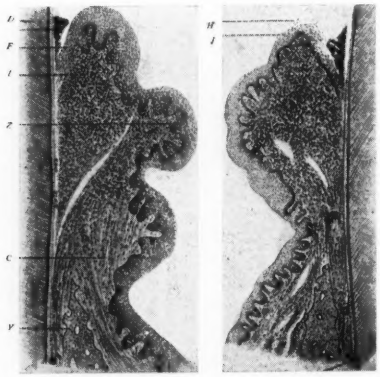


Fig. 3.—d. dentine of the tooth; p, tartar; f, papillary layer of gum; z, epithelial covering; i, infiltration of the gum with white blood corpuscles; c, healthy part of the gum; y, healthy bone. Magnified 80 times.—*Znamensky.*

Fig. 3 A—Shows the same parts at a further extension of the disease. The peeling off of the epithelial covering can be seen (h); a wounded surface is being formed (y). Magnified 80 times. —*Znamensky.*

You will notice from the illustration that the necks of all these teeth and approximal surfaces are black. This black color is due to the application of a solution of iodine and iodides, first suggested to us by Doctor Talbot for treatment of inflamed and irritated tissues and later modified by Doctor Skinner for the purpose of revealing to the eye of the observer the bacterial masses upon tooth surfaces.

The question is, what is this material which stands out in such bold relief when treated with disclosing stain? Is it simply muco-plaque material, or is it living bacteria, or both? If it is largely bacterial, what are the most constant forms found on tooth surfaces? The study of hundreds of smears taken from this locality on the tooth surfaces discloses the fact that we have universally present on the tooth surfaces and at the gingival margin, several types of bacteria, and these types do not stain equally well with the same stain. The absolutely universal type which stains best by the Gram method is the streptococcus viridans or the streptococcus salivarus, by others called the streptococcus mites. This organism is absolutely universal and the writer believes it an impossibility to find a human mouth that will not produce this organism. If the Giemse method for staining bacterial smears be followed, one is equally certain to find the presence of fusiform bacillus and spirochaete. The author believes that this member of the streptococcus viridans family just mentioned and the fusiform bacillus and its accompanying* spirochaete are universally present in all pyorrhea pockets and tooth surfaces. The fact that some observers report one thing and some another does not alter the fact that these bacteria are present. It is merely an evidence of the fact that the individual has not followed proper methods for staining to make their presence evident. If he is dependent on one type of stain, it may be that that particular stain was not suited to bring out the character of growth there present. For instance, the Gram method for staining does not show clearly spirochaete and fusiform bacilli, while the Giemse method for staining will show fusiform

*T. J. Oleary in Dental Cosmos 1910, Vol. 52, page 52.

bacilli very clearly while certain other types of bacteria will not stand out clearly. The tooth surface scrapings have been shown to contain almost every sort of bacteria that grows, but the pyorrhea pocket itself has thus far revealed to the author and his associate only two types of organism which seem to be absolutely constant, namely, streptococcus viridans, and the fusiform bacillus with its accompanying spirochaete, staphylococci, pneumococci, proteus, bacillus-coli, subtilus, micrococcus-catarrhalis, and many other bacteria are occasionally found and the entamoeba is present in a certain number of these cases. The author and his associate, Doctor Henrici, have not found the entamoeba to be universally present. It is true that we have found the entamoeba in three-fourths of the cases examined, whereas we find the spirochæte, the fusiform bacillus, and the streptococcus viridans absolutely universal in their presence. In fact in our search for bacteria-free root ends in living teeth, we discovered that it was necessary to actually burn with a cautery the tissues under the gingival margin if we expected to find the root ends free from bacterial growth, and until we did so begin to sterilize by actually burning the tissues beneath the gum margin, we always without exception found the tooth's root infected. Personally, the author believes it to be almost an impossibility to extract a healthy living tooth and find the root free from viridans unless the tooth has been rendered free from bacteria by rubbing the tooth with iodine and by subsequently burning the gingival field with the actual cautery. Even with the above precautions we found living teeth **whose roots were infected,** showing that the vessels of the peridental membrane form the path thru which root ends are most commonly infected.

The finding by culture of viridans below the level of attachment in the membrane also impresses us with the thought that streptococci are the principal organisms of pyorrhea and that amoeba and all other germs are contributing factors only. After having worked this technic out we were able to occasionally extract living healthy teeth and find the deeper tissues sterile. Furthermore, in working along this same line, we find that when the Ionic method of sterilization has been followed out carefully in teeth that previously showed areas of rare-faction by the radiograph and bacterial infections by culture, by practising this careful technic for the exclusion of possible bacteria that have gotten into pyorrhea pockets from the tooth surfaces and of mouth fluids that the abscess sack on extraction would be sterile, proving conclusively that it is possible to actually destroy bacterial growth in the tissues of the abscess sack by this electrolytic* method.

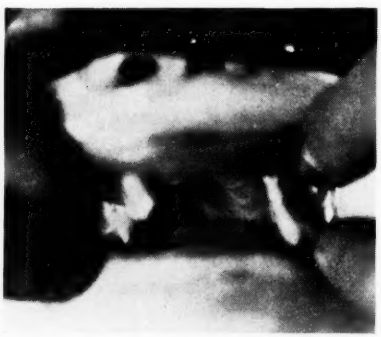
The author introduced this bit of experience here because it tends to prove the universal presence of streptococcus viridans in the tissues surrounding the teeth, and, while we all recognize the fact that we may obtain from tooth surfaces at one time or another almost every known bacterium, we certainly must concede that the bacteria which we find **constantly deep in the tissues are the ones logically concerned in the inflammatory disturbances going on in these tissues.** Some of you may be surprised that the writer does not attach more importance to the presence of entamoeba in pyorrhea pockets and does attach so great importance to bacteria found in the tissues beyond the pockets. Therefore, the writer will break the thread of his discussion by introducing a series of pictures of amoeba to which he invites your attention. Before showing these pictures he desires to say that he welcomed with the greatest enthusiasm

*Rhein Paper, on page 999, Cosmos 1911.

the possibility of curing pyorrhea alveolaris by destroying amoeba by the simple method recommended by Barrett and Smith of Philadelphia, (*1), and Bass and Johns of New Orleans, (*2). While the author had occasionally noticed the fact that amoeba are present in the mouth, he had never attached any particular importance to them; in fact, he might state that amoeba have been particularly prolific in his own mouth for a long time, tho he is apparently free from pyorrhoeal inflammation, so it never occurred to him to connect the amoeba with pyorrhoeal processes in any way. Believing, however, that the work of Barrett and Smith and Bass and Johns deserved full credit, he obtained from the Parke Davis and Company one quart of one per cent emetine chloride and very promptly began its use on a series of pyorrhea cases under his care, following carefully the technic advised by Barrett and Smith in this work, which is daily dosage of one per cent solution of emetine chloride discharged deep into the pockets for a series of six days, then alternating the dose every other day until twelve or fifteen doses had been given, hoping thereby to cure these cases. The writer's experience has been that the injection of emetine chloride has not in a single instance stopt pus flow, tho amoeba have been found to be present in three-fourths of the cases.

Fearing that the emetine chloride solution might be at fault, the author's associate, Doctor Henrici, administered ten cubic centimeters of the chloride to a rabbit which promptly evidenced all the constitutional effects of emetine, subsequently dying. Failing to get satisfactory results or results tending to cure with one per cent solution injected into the pockets, we therefore, obtained fifty grains of emetine and commenced a systematic use of emetine hypodermatically, giving as a routine one-half grain per day for three days, then one-half grain every other day for two or three days more, then resting. In no single case has the writer been able to notice freedom from pus flow. One patient, a child of twelve years, who had an exaggerated case of phorrhea having lost all the teeth in the upper jaw but the right cuspid and all the teeth in the lower jaw but the second molars and bicuspids, received in all twenty injections of emetine chloride into the pockets about these teeth and subsequently two and a half grains emetine chloride hypodermatically. The pus flow has not in any measure been checked as far as the author is able to judge. The gums are inflamed and at a recent public clinic at the mid-winter meeting of the Minneapolis district Dental Society, many men at this clinic were able to see pus from the gums of this patient. (Lantern slide of Figures 4 and 4 A). Lantern slides of amoeba (Figures 5 A, 5 B, 5 C, 5 D.)

Fig. 4



Mouth of twelve year old child suffering pyorrhea, unsuccessfully treated with emetine hydrochloride.

In this connection, study closely the amoeba found in the following lantern slides. You will notice that the amoeba in these preparations were taken from

*1—Barrett and Smith, Dental Cosmos, 1914.

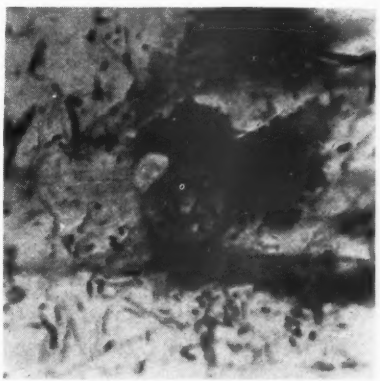
*2—Journal American Medical Association, Feb. 13, 1915.

pyorrhea pockets fixt in a saturate solution of bichloride of mercury for a half hour and subsequently stained by the Giemse method. You will note that the ectoplasm and endoplasm stand out sharply. The digestive vacuoles and nuclei show equally well, and you will also note what is infinitely more interesting than any other fact about the amoeba so far as the author and his associate, Doctor Henrici, have studied them, that invariably these protozoa contain within their limiting membranes, many bacteria. The author personally has counted seventy micrococci within the protoplasm of a single amoeba and almost invariably these amoeba, when properly stained, are shown to be in the process of phagocyting bacteria, while only about half of them contain within their protoplasm the remnants of other tissues. It is true that a few of the amoeba studied by us seem to contain the phagocyted nuclei of leucocytes, but the amount of phagocyted material within the limiting membrane of the amoeba seems to be comparative-

Fig. 4 A.

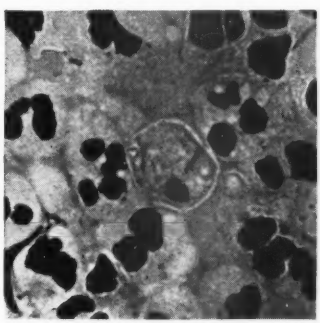
Picture of this healthy, robust looking child.

Fig. 5 A.



Entamoeba buccalis containing a phagocyted chain of streptococci.

Fig. 5 B

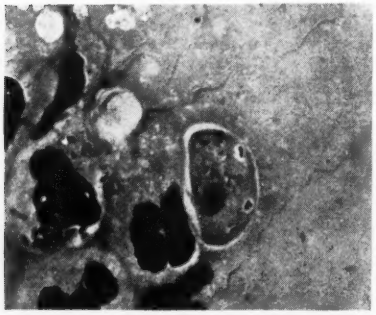


Entamoeba buccalis containing phagocyted fusiform bacilli.

ly slight when contrasted with the great number of bacteria within their protoplasm.

The thought naturally comes into the

Fig. 5 C.



Entamoeba buccalis containing phagocyted diplococci.

mind of any one who studies this group of pictures, can an organism in the tissues which is so destructive of bacteria

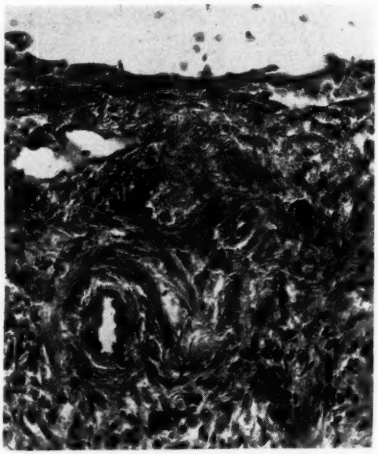
Fig. 5 D.

Entamoeba buccalis showing phagocyted cocci.

which we absolutely know to be responsible for many types of secondary inflammation as well as the chief etiological factor in apical abscess. I repeat, can an organism, which is so destructive of bacteria which are harmful to the human body, be accounted unfriendly? If all amoeba are as destructive to bacterial growth as are the ones shown on the screen here, it would seem a better plan to perpetuate their growth rather than to destroy them.

I here invite your attention to a se-

Fig. 6.



Pyorrhea alveolaris: Ulcerated margin of the gum showing chronic inflammation—no amoeba in the tissues altho many were present in the pus.

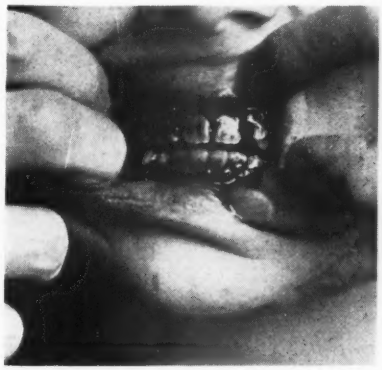
ries of lantern slides showing human tissue taken from the sides of human teeth which were exhibiting intense pyorrhoeal inflammation. These tissues were removed with the teeth and hardened, cut, and stained for the express purpose of studying their amoebal content. We find many bacteria on mucous membranes, and the smears from the pockets taken before these tissues were cut away showed a few amoeba and infinite numbers of what proved to be streptococci in culture. A close study of these tissues, however, does not reveal a single amoeba embedded in the tissue. It would seem if amoeba were

pathogenic that these five cases should show amoeba embedded in the granulation tissues of the bottom of the pockets, but they do not.

In the last two years, we have been encouraged to believe by Hanssen of Christiania (*1) that there was a specific micro organism responsible for pyorrhoeal infection, designated by him as bacillus pyorrhea, tho the writer has been absolutely unable to find an organism corresponding to the bacillus pyorrhea of Hanssen in pyorrhea pockets. The bacillus subtilus, a common laboratory growth, more nearly fills the morphological and cultural requirements of Hanssen's bacillus than any we have yet been able to find.

The medical and dental professions all over the world have been lead to believe that the amoeba is the responsible factor for all pyorrhoeal processes and that its destruction would be a panacea in the cure of pyorrhea, and the author earnestly hopes that this may be true. Nevertheless, his own experience does not lend color to this belief and we are thrown back upon the best teacher we have had in this matter up to the present time, experience, which indicates in no uncertain terms that the gingival margin is the point where pyorrhoeal inflammations begin and that the pyorrhoeal inflammations are wrought by and maintained by the poison **proteins** (*2) **induced** by the presence and destruction of mixed bacterial infections, by the body ferments, and experience has also taught us that clean tooth surfaces preclude gingival infection and that heavy massage of the gums also tends to harden and render more resistant the gingival margins to infection. Experience has further taught us that the logical place to begin the treatment of pyorrhea is the tooth's surface and that the first step in the treatment of any pyorrhea is to demonstrate to the patient and to the operator the relative amount of bacterial growth on the tooth's surface. (Fig. 7) This is important to them both, important to the patient because it directs his attention to those areas of the tooth's surface which need the greatest daily care, and important to the operator because it explains to him the reason for gingival inflammation where often times no other rational cause can be found. Following

Fig. 7.



Bacterial masses on tooth's neck.

such demonstration, the next step should be the elimination of all rough areas on the tooth's surface which may retain bacteria on or in the tooth's surfaces, and this is accomplished by applying to them, the type of stones shown on the screen, (Fig. 8) swinging them across the enamel surfaces, thus grinding out the pits that have been induced by the acid formed by the bacteria on these surfaces, getting rid of the bacteria themselves and polishing out the inequalities which serve to retain and foster bacterial growth. After the use of the coarse stones on the tooth surfaces, disclosing stain should be again used to make sure that all pits have been beveled out. After all pits that

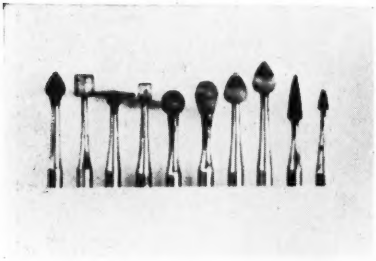
*1—Journal of Norweigan Dental Society, 1914.

*2—Victor C. Vaughan's—"Protein Split Product in Relation to Immunity and Disease."

contain bacteria and inequalities have been beveled out, and the application of the disclosing stain reveals nothing, then the tooth surfaces should be thoroly polished with the type of Arkansas stones shown on the screen, and the brilliance increased by the use of Moosehide wheels loaded with jeweler's rouge or with any other abrasive which will give a high degree of brilliance to the enamel.

When the tooth's surface has been properly cared for in this manner, we are then ready to attack root surfaces.

Fig. 8.



Arkansas and Carborundum stones used to perfect the tooth surfaces.

Before proceeding to a discussion of the pyorrhea pocket, the author desires to discuss for a moment other forms of irritation than that of bacteria which may be responsible for gingival inflammation and will make the statement that any irritant which will induce congestion of the gingival margin favors bacterial infection; e. g. lack of contact point, permitting the bruising of the soft tissues ill fitting regulating appliances, the mechanical irritation of bands, imperfect fillings, malocclusion, thus delivering undue force in some point in certain direction, all of which induce congestion and which in time stimulates osteoclasis and destruction of the bone just as surely as will bacterial growth or the continued application of force by regulating appliances.

There is an additional reason for beginning the treatment of pyorrhoeal in fection on the tooth's surface, the introduction of polishing materials into the pockets themselves. Pumice or silex introduced into the pocket must always be an irritant to the tissue cells of the surrounding area. If all polishing and cleansing of the tooth's surface is done before the pockets are disturbed by scalers or planes, we avoid getting polishing material into them.

There may be a specific micro organism which is responsible for pyorrhoeal infection. While we have not proven the streptococcus viridans to be the specific organism, we are thoroly of the opinion and belief that this family of viridans is the chief offender, because of its universal presence in the pockets and in the tissues and because of its definitely proven relationship to dental abscesses and secondary lesions. It is not proven, however, that it is certainly the etiological factor, tho the evidence is slowly accumulating which in the end may be accepted as proof, sufficient to justify our believing it to be the specific factor, for wherever this organism locates in the tissues the result is death of tissue and the question naturally arises, where and how does it enter the tissues? Some authors (*1) would have us believe that it is blood borne and introduced thru the tonsil or from some other area of the body. The author does not believe this to be true, however, for the reason that most observers unite in the belief borne out by experience that the streptococcus found in tonsils is haemolytic. Davis (*2) reports ninety per cent out of 115 cases to be haemolytic. Rosenow's observations confirm the belief that the streptococcus found in tonsils is haemolytic. Dwyer and Gignoux also confirm this

*1—Ulrich Dental Review 1914.

*2—Davis Journal Infectious Diseases, Vol. 10, 1912.

fact. (*1) In the author's experience with two hundred and fifty cases, only one root tip abscess was proven to be haemolytic, which streptoccocus was found and isolated from a dental abscess in the mouth of a young Hollander by Mr. Gaskill in the early part of the winter of 1914. (*2) With this one exception, no other example of haemolysis was found by Mr. Gaskill and in some two hundred cases in which the streptococcus viridans has been isolated in pure culture by Doctor Henrici, no single example of haemolysis has been observed of a family of streptococci isolated from root tip abscesses or pyorrhea pockets. Gilmore and Moody (*3) reported a short series of cases in which they found haemolysis but the haemolysis was not definitely proven to be due to streptococci as they cultured directly from the infected field to blood agar, and there are other bacteria save haemolytic streptococci which will haemolyse blood, and the haemolyses reported by them may be and is probably due to the admixture of other bacteria in their cultures. In our own work, our cultures (*4) have invariably been plated out until the bacteria were obtained pure, and I repeat, none of these cultures have been haemolytic. I, therefore, do not believe that the infecting streptococcus in either the dental abscess or the pyorrhea pocket is introduced from the tonsil or the general blood stream, because if it came thru the tonsil path and was deep in the tissues, it certainly should haemolyse. (*5) We are, therefore, thrown back on the belief that these bacteria are introduced into the tissues by direct continuity of tissue following down from the tooth neck into the pocket and also that apical abscesses may be planted from bacteria introduced in the same manner or thru the root canals themselves. That it is easily possible for bacteria to enter the peridental structures from the gingival culdesac is a fact. The writer of this paper has repeatedly demonstrated openings in the bottom of the gingival crevice of seemingly healthy teeth and these openings may readily be shown to exist by the use of oxygen under compression which may be allowed to flow from a blunt nosed needle into the gingival crevice. The needle is not to be thrust into the tissues but simply introduced into the gingival crevice, without pressure of the point into the tissues. A stream of oxygen thus directed into the gingival crevice will usually find its way from two or three points at least into the tissues and its movement in the tissues may be noticed for distances of as much as a half an inch or more away from the point of entrance.

The author has repeatedly demonstrated this possibility in the case of his own teeth, the gums of which are healthy, firm, and pink, and has also noted it in a large number of other individuals and he believes that it is thru these openings leading into the deeper structures around the teeth that the bacterial infection of these structures occur. Without doubt, the most valuable work that has yet been done in the gross pathology of inflammation of the tissues contiguous to the teeth is that of Doctor Talbot, (*1) and the author now invites your attention for a few moments to pictures from the work of Talbot. Doubtless, these are familiar to most of you and the writer desires these pictures here in order to illustrate a phase of the treatment of this disease which has always seemed exceedingly important.

*1—Dwyer & Gignoux Bacterial Exam. of Tonsil crypts, from Manhattan eye, ear, and throat reports, Feb. 1912-1913.

*2—Hartzell Dental Bulletin 1914.

*3—A study alveolar abscess and infected root canals.—Journal A. M. A. December 5.

*4—National Dental Bulletin—Report on Infections of Mouth—Hartzell, Henrici, Leonard.

*5—Barn's—The tonsils, pages 68-69.

*1—Talbot—Interstitial Gingivitis.

(Lantern slides of Talbot illustrating lesions of pyorrhea.) You will notice in these (Fig. 9) pictures that the soft tissues are ulcerating, that the peridental membrane has been destroyed to a considerable depth, and that the cemental coat of the root surface is rough and irregular, and that there is no exposed bone showing in the pockets. You will also notice the dense masses of leu-

Fig. 9.

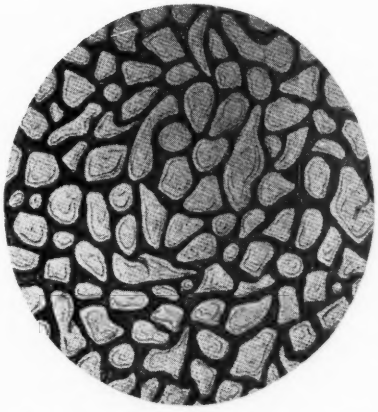
Rough root surface, ulcerating gum margin, and bone of the alveolar process covered by a layer of granulation tissue.—*Talbot.*

cocytes which predominate in the mass of ulcerating tissue surrounding these roots. The application of the principles of surgery to a study of the lesions of this type would seem to indicate that the first thing to be accomplished would naturally be the removal of the dead, dying, and necrotic tissue which pockets of this type are sure to contain. The enormous mass of leucocytes encompassing this field ought under normal conditions to overcome these infections. These leucocytes are naturally engaged in phagocyting the bacteria growing in these pockets, and there is not the slightest doubt that this wall of leucocytes destroys an enormous amount of bacteria found growing in these crevices. In addition to the phagocyting of this bacterial mass, the wall of leucocytes acts also as a limiting factor in the spread of bacteria from these foci into the general circulation. However, we all must realize that the leucocytes tho endowed with amaeboid movement cannot and do not readily cross the crevice to the root itself and the bacterial examination of the material of the root itself shows that it is always heavily loaded with growing organisms. It naturally follows therefore that on account of the rather limited movement of the leucocytes that they only do efficient work in the destruction of bacteria, as bacteria are brought in close contact with them and the tooth's root surface must of necessity receive little or no help from them. Here for a moment study pictures of tooth root surfaces as they appear when the fibre ends are digested out of the tooth's root surface by appropriate media. (Show lantern slides of tooth root surface.) Figs. 10 and 11.) You will note in the study of this second slide which is under a quarter inch subjective that it presents three distinct characters of tissue, namely, this rough surface that has been untouched by instruments which appears on the left. The center of this field shows a great many lacunae and the right side of this same field shows a plane surface in which there are a comparatively few openings. This particular slide was especially prepared to contrast these three conditions.

The author next invites your attention to this picture which shows distinctly the dentine of the tooth structure and outside or overlying this dentine field, you will note the inner layer of the cementum in which you see a great number of lacunae. (Figs. 11 and 12.)

These lacunae are most numerous near the ends of the dentinal tubuli and diminish in number as we approach the outer surface of the root. Turning back to the slide which presents the three characters of surface, you will notice that as we closely approach the surface of the root there are comparatively few cemento blasts in the lacunae of the cementum and that there is a consider-

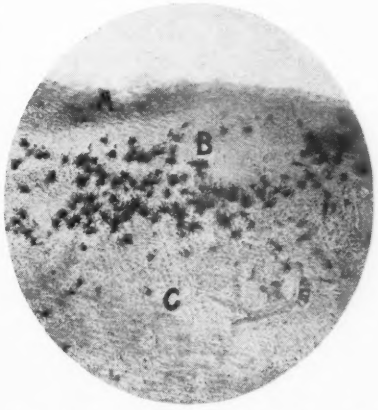
Fig. 10.



Area of root surface showing its pitted character, the white areas being the stump holes of fibre ends. The dark areas show the more dense walls of the pits, prepared for Dr. Hartzell by Doctor Carl R. Lemstrom.

able breadth of tissue in which there are very few or no cementoblasts. I wish you to give particular thought to the morphology and histology of this tissue, as the writer believes it to be infinitely important in the treatment of pyorrhea pockets, because it affords the reason for planing root surfaces and also shows just the depth one dare cut to advantage. Following the general rules of surgery with infected pockets of this type the natural thing would be to curette the ulcerating tissue. As far as the necrotic remains of the soft tissues surrounding the tooth's root is concerned, that is surgically easily accomplished. As for the alveolar process itself, you will notice from a study of Doctor Talbot's pictures that the bony process itself is seldom exposed in the base of

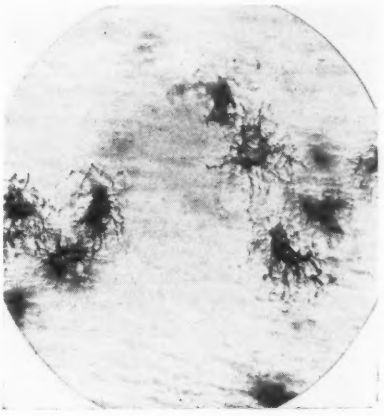
Fig. 11.



A, Surface correctly planed; B, area of root too deeply planed; C, area of root surface not treated.

the pocket, and that the very deepest portion is densely packed with leucocytes. Therefore, the greater amount

Fig. 11 A.



Shows lacunae from center of field in Fig. 11.

of material, which is stinking and necrotic, to be removed from these pockets is resident on the root surface itself

and experience in thousands of cases has taught us that careful removal of serumal deposits in those cases where serumal deposits (Figs. 13 A, 13 B) exist together with the careful removal of necrotic remains of the peridental membrane wonderfully increases the health of the surrounding tissues in a marvelously swift manner. The exact technic of doing this work on the root's surface involves very much more than would appear from a casual study of these tissues. In the first place, the amount of dead necrotic material upon the root surface, while considerable in area, is very shallow in depth and when instruments of any character, planes, files, or scalers are thrust into these pockets, the operator should have in mind the structure of the tissue upon which he operates for the simple reason that if in removing the dead necrotic root surface, the operator carelessly cuts down a sufficient depth to open the lacunae of the cementum, that tho his initial result may point toward health in the improved appearance of the gums and surrounding tissues yet in the end these root surfaces re-infect because the lacunae have been opened and their protoplasm must soon die and become the host of an infinite number of bacteria. Therefore, the surgical treatment of these root surfaces should be done with great care and delicacy and the operator should aim to remove all of the dead necrotic remains and leave a brilliant smooth surface. Such surfaces do not readily re-infect as they have nothing upon them to hold bacteria whereas roots that are scraped deeply into the cementum will always hold bacteria. The writer believes this fact explains why certain operators who handle the teeth they treat roughly have many recurrences of infection while others who have greater skill and patience have comparatively few recurrences of infection. The moment the dead root surface has been carefully removed, the inpour of new leucocytes is exceedingly rapid because the blood vessels which supplied the bone and peridental membrane have not been entirely destroyed, tho their ends have been blocked by an obliterating endarteritis, which is the specific lesion of pyorrhoeal infection. The operative interference necessary to

Fig. 12.

Lacunae near ends of tubuli.

Fig. 13 A.

Calculus on root surface. How futile to expect medicines of any kind to benefit a tooth of deposits of this character.

clear the root surface breaks down these endarterial structures and permits of a great outpour of blood into the pyorrhea pocket itself. This bleeding is an excellent thing as it tends to carry out of the pocket infinite numbers of bacteria and also introduces into the pocket fresh arterial blood, which is nature's provisional filler of every wound and a better antiseptic for such wounds than any drug which we could place in them. To briefly describe the character of this type of surgery may be of some interest

Fig. 13 B.

Calculus on the root surface.

in this connection. It is most easily accomplished with the planes of self-limiting cutting depth. The operator should begin at the neck of the tooth and with short strokes remove the dead material, each stroke going a trifle farther into the pocket until he finally has planed off all the objectionable material to be removed. As the surface cannot be seen the operator must depend on his sense of touch. On root surfaces where there is no deposit, the sharp plane encounters first the dead peridental membrane which evokes a sensation which the author might liken to touching silk velvet, a sort of fleshy feeling. A few strokes with the sharp plane removes this velvety material and brings the plane in contact with the uneven bony surface of the root itself. This produces a sensation entirely different than that produced by the touching of the dead peridental membrane and cannot be well described in words. If, however, the root has upon it serumal calculus, the sensation conveyed to the operator by the plane bit thru the medium of the handle of his instrument and the plane bit, might be comparable to the application of a steel edge to a concrete or stony surface. Upon removal of this stony, gritty material in the one case, or the removal of the velvety dead remains of the peridental membrane in the other, the plane bit rapidly renders the surface smooth and conveys to the operator a sensation comparable to that evoked by rubbing a steel burnisher over polished ivory. In contrast to the sensation evoked by touching dead peridental membrane or calcific deposit, the sensation is so markedly different that after it has once been experienced, the operator can definitely know that he has removed all that should be removed from the root surface. If now the operator, heedless of the fact that he has reached the hard layer, continued to cut with sharp instruments for a few seconds on this smooth ivory-like surface, which he has been able to produce by the removal of dead peridental membrane or calculus, the operator will soon find that the instrument will chatter and the sensation will be as vitally different to him as the sensation evoked by bringing a sharp curette over the bony plate of the alveolar process as compared to the sensation evoked by the same curette when used in the spongiosum of the loose areolar bone inside of the bony plate. It naturally follows that the fewer lacunae opened, the less subsequent re-infection. As the operator approaches the bottom of the pocket he will encounter granulation tissue. This granulation tissue is a mass of leucocytes which interposes between the bottom of the pocket and

living tissue beyond and serves to protect the living tissue beyond from further incursions of bacteria and also surrounds the obliterated ends of the vessels which fed the tissue. It is an advantage to press the plane bit into this mass of leucocytes in order that every bit of diseased root surface may be removed and also to break up the granulating wall and open the obliterated ends of the vessels in this locality. The action of the plane bit will naturally withdraw from the pocket most of the planed

Fig. 14 A.

Spongy bone growing in glass tube.—*Macewen.*

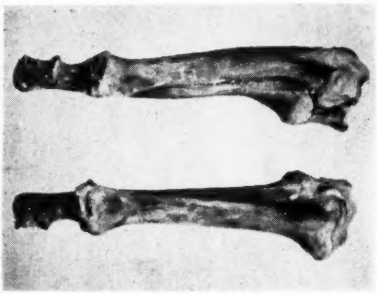
off material. If the operator is in doubt as to whether the pocket is free from loose material, it is wise to syringe the pocket with Ringer's solution or normal salt solution.

Assuming always that the **diagnosis** has been **properly** made and the **advisability** for treatment of any **given case determined** and that the work has gone forward to the removal of the diseased root surface, the next thought which confronts us is the possible regeneration of bony process to compensate for that which has been lost. The regeneration of bone of course precedes from living bone. This has been well proven by the work of Macewen (*1) of Glasgow, (Figures 14 A and 14 B) whose classical

*1—Macewen—"The Growth of Bone."

experiments in this direction must ever be remembered. He was able to remove portions of long bones in dogs and interposed between the cut ends of these bones small glass tubes which glass tubes filled up with new bone in from four to six weeks, the outpour coming from the cancellus bone cells of the ends of long bone and not from the periosteum. Accepting the fact that new bone (Figures 15 A and 15 B) comes from pre-existing bone cells, can we do (Fig. 16) anything which will tend to repair the

Fig. 14 B.



Transplanted sections showing perfect union.

loss of bone already suffered? The writer believes to a limited extent that we can, by simply following the laws of general surgery in relation to bone growth. Therefore, our need is freshly opened bone cells, absence of general infection, absence of pressure, and rest. Presuming the pyorrhea pocket and root surface to be as surgically clean as they can be gotten, our next step is to reach into the process with a fine sharp instrument and lightly stir or roughen up the process edge. This stimulates the bone cells to an outpour of callus. If the pocket be filled with sterile blood clot, the new bone cells pour out and in some instances actually pile up against the root surfaces never in great amount because the pressure of surrounding tissue limits the amount of outpour, be-

cause we begin to have shrinkage of the overlying soft tissue as soon as we remove the irritating debris of the root surface, which shrinkage of the gum limits the outpour of bone from the thin process

Fig. 15 A.

The implanted tooth in socket from which 13 B was removed.

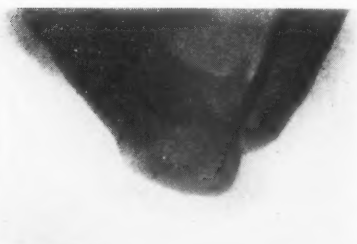
edge. The subsequent entrance of bacteria from the tooth's surface and saliva into the pocket also tends to limit the bony outpour. Movement of the teeth themselves also tends to limit the bony outpour. If, however, the teeth are made

Fig. 15 B.

New bone around implanted tooth one year later.

rigid by a splint, the root surface clean, the process edge lightly curetted, the pocket filled with blood and protected from infection, we can confidently expect a certain amount of bony outpour from the process edge. Just in proportion as we can maintain these sensible requirements will we be able to gain bone. Some men deny the possibility of regeneration of bone of the jaws. The author draws your attention to a lantern slide in a case first operated by Doctor R. E. Farr, of Minneapolis, wherein he removed an inch and a half of the mandible for the removal of a malignant growth. The writer subsequently placed a splint of iridio-platinum wire connected with the left cuspid and laterals and the right second and third molars. A radiograph of this jaw some two years after the splint was put in position

Fig. 16.



Radiograph of Dr. Farr's case showing complete repair of mandible from whence one inch had been removed. An iridio platinum splint placed by the writer to hold the cut ends apart can be seen in the picture.

shows that the bone reached across from the left to the right side and that the bony continuity of the mandible has again been restored.

The writer also wishes to show in this connection, a picture which illustrates the ability of the process to pour out new bone around and against the teeth. This particular picture was obtained from the late Doctor Fletcher with whom the writer of this article had much in common. Its origin was briefly as follows: (Figures 17 A, 17 B, 17 C).

A patient had applied to a dentist for the removal of a lower bicuspid tooth. The dentist had attempted its extraction and had broken the tooth off well below the gum level and had then left this tooth in position. The gum had healed

and the patient was none the wiser. Subsequent disturbance in that locality caused the patient to apply to Doctor Fletcher, who discovered that this root still remained in the socket. He cut down upon and uncovered this root and discovered that the alveolar process seemed to cover it. He extracted the

Fig. 17 A.

Extracted tooth with new bone in pulp chamber. Fletcher's case.

root and subsequently had sections made, a picture of which I throw upon the screen, showing new bone deposited on the broken root end and pulp chamber of this tooth. A second picture shows an area of alveolar process photographed from the center of this chamber. While we all recognize the fact that the alveolar process is not a favorable field for regeneration, these examples show conclusively that if we can maintain our case under proper conditions that we certainly may expect a small amount of new bone at least in many cases. That bony outpour does frequently happen in the experience of every man who treats pyorrhea is proven by the fact that teeth that have been denuded of a large amount of bony support subsequently treated successfully become more rigid comparatively speaking than healthy teeth that have never undergone pyorrhoeal inflammation. The explanation of this fact is that a small amount of new bone has been poured out and piled up directly against the

Fig. 17 B.

Pulp chamber of 17 A showing new bone.

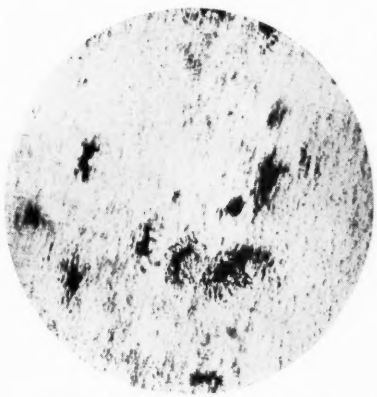
root surfaces, and, having no elastic peridental membrane interposed between the root surface and the new bone, you have an analogy to ankylosis which occurs about implanted teeth. Presuming that this treatment of a case has been successfully carried to this point, is there anything further the operator may do to enhance regeneration? The author believes there is, and that the next step should be to protect the sterile blood clot in the pockets from the incursion of bacteria from the saliva and the tooth's surface. The bacterial growth is constantly recurring on tooth surfaces, and its inhibition or prevention must necessitate a constant battle to the end of life. Immediately, following the surgical treatment, the application of

some substance which will seal the pockets, shut and protect them from bacterial incursion is advisable. Many substances have been recommended for this purpose. The most valuable one of which the writer has knowledge is the following:

Merck's beechwood creosote saturated with all the iodine it will dissolve.

This makes a heavy black oily mixture

Fig. 17 C.



Lacunae from center of 17 B. Fletcher's case.

and is to be applied to the gum edge and to the neck from one-eighth to a quarter of an inch to the gum edge and reaching up on the tooth neck to the enamel of the crown. Carefully preventing the saliva from touching this after it has been placed, we immediately apply a second coat composed of glycerine in which we have incorporated all the tannic acid that it can be made to dissolve. Thus the tannic acid most completely covers the first coat of creosote-iodine, and, if it is placed before moisture comes in contact with the creosote-iodine, the two solutions seem to unite and form a dense, tough, black brown material which will cling to the tissues from twenty-four to forty-eight hours, protecting the gingival margin from a bacterial incursion for that period of time. If thought advisable by the operator, the coating may be repeated every other day for several days, thus maintaining a condition of approximate asepsis. The author might state in passing that the application of this double coating to sutured incisions in the mouth protect these edges from infection and renders a wound much more comfortable than otherwise would be the case. It may also be applied to the cut edges where third molars have been uncovered by removing the gum. As soon as the bleeding has been checked by the application of hot packs, the cut surfaces may be coated with this heavy iodine solution followed by the tannic acid glycerine solution and the cut surface will be protected from infection and also from the irritation of the movement of the tongue. The method of carrying on pyorrhea treatment should follow certain definite lines and the judgment of the operator should be governed by the condition of the patient. In cases where we have only mild gingival inflammations and shallow pockets, the work may be rapidly accomplished without hurt to the patient. On the contrary, if the patient be subnormal in resistance, the pockets deep and heavily loaded with organisms, then the operation should be continued over a period of weeks involving only two or three teeth at each treatment. There are two reasons for this course. The first is that if the limiting wall of granulation tissue so beautifully shown to be present in all these pockets by the pathological work of Talbot and others, I repeat, if the limiting wall of granulation tissue be broken down rapidly, an enormous inoculation of the patient occurs at once, and this enormous inoculation may result in an acute disturbance, wherein metastatic transfer plays an important part, and result in a myocarditis, endocarditis, joint infection, or acute abscesses, or chronic infection of the kidney.

The author has learned by bitter expe-

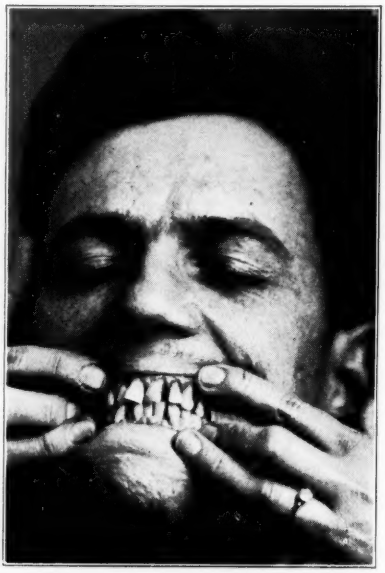
rience in the treatment of actual cases that haste in the treatment of these subnormal cases is exceedingly dangerous and subversive to the best interests of the patient, as he has noticed acute joint infection and even pneumonia to result in rapid sequence from, as he believes, over-inoculation from the tearing down of the limiting wall of the granulation tissue which must of necessity be broken down in the rapid treatment of these cases. A second reason for slow treatment by easy stages of these pyorrhea cases lies in the fact, that if the dosage of bacteria be gradually increased from

Before Treatment.

time to time, the ability of the blood stream to overcome the recurring doses of bacteria which of necessity must be forced into the blood stream by the surgical treatment, gradually raises the immunity of the individual so that at the end of a period of a month or six weeks' treatment of a case of this type, the patient's general resistance is steadily raised, appetite, ambition, and general well-being enhanced. In fact, treatment so carried on has all the good advantages of a polyvalent vaccine and none of its disadvantages. The post-operative care of an individual deserves also careful consideration.

MASSAGE—WHEN AND WHY ADMINISTERED.

Massage of the gum margins should not be commenced following operative treatment until all outpour of bony callus from the process edge has ceased for the simple reason that massage tends to shrink and toughen the gum tissue and prevents further bony callus being poured out. As soon as the operator is satisfied with the amount of bony callus which he has gained, he may then begin massage. This massage should be



After Treatment.

Blood pressure fell from 150 to 120. No treatment and no emetine or other drug was administered, showing clearly that it is possible to bring about great changes in the treatment of Pyorrhea without drugs by efficient surgery only.

suited to the gum tissue. Perhaps the best method of massaging the gums is with the cut end of the short heavy cotton roll. The dry cotton roll clings to the gum tissue and when held in a haemostat of a kuroris is easy of use by the patient. Its advantages are briefly that it expels the stagnant fluid from an oedematous gum margin and permits inflow of fresh arterial blood. The act of massaging the gum margin drives into the circulation any bacteria that may

have gained access into the tissue and places them where the leucocytes of the general blood stream will rapidly phagocyte them. General massage is in itself a kind of auto-vaccination and drives the enemy out of the field of action where it is more easily conquered and replaces the enemy in the field of action with new soldiers from the blood stream with the added benefit that the epithelial coat and connective tissue composing the gum is caused to grow more firm and dense and resistant, thus fortifying the gum margin from further infection by enhancing a more perfect structure and locking the door to further infection. The weekly use by the patient of the disclosing stain to guide him in his daily mouth hygiene has a double benefit. The solution now used by most men for disclosing purposes is that mentioned in the beginning of the article, and, tho many times published by those who use it, the writer will give its composition once more for the benefit of the younger men who do not happen to be acquainted with it: Iodine, fifty grains, zinc iodide and potassium iodide each fifteen grains, water and glycerine each four drams, making a total liquid bulk of one ounce with a total bulk of eighty grains of solid material incorporated therein. This should be very carefully triturated and may be sponged on the soft tissues and tooth surfaces without harm occasionally. The author believes it is too concentrated for daily use. Its double benefit accrues from the fact that it destroys instantly the vitality of the bacteria with which it comes in contact and also brings into view the fields where they grow in greatest number undisturbed, thus guiding the patient to a more careful effort in the daily hygiene of the mouth.

Daily prophylaxis by the patient is the greatest safeguard against reinfection and the monthly prophylaxis treatment by the dentist is the best guide to the patient's endeavor. Treatment by the dentist should be very carefully done and not left to careless hands. In this prophylaxis work the injury of the gum should be distinctly avoided as well as injury of the enamel surface and exposed cementum. It is possible to conceive that too vigorous or ill-advised use of the polishing material on either the enamel or dentine surfaces can do these tissues great harm, even destroying or cutting grooves in them, and has given ground for criticism by many conservative men. This phase of treatment is so well understood that the author deems it unnecessary to discuss it under a special head.

There is, however, one more thought regarding this matter which appeals to the writer as a vast importance, and that is the question of so guiding the daily life of a patient in the matter of food and diet that the oral cavity as well as the balance of the body increases its immunity to all types of infection. The work of Doctor Pickerel and Professor Gies of Columbia in this direction should be read and understood by every one of us. The work at present being carried forward by one of our own number, Professor Bunting of the University of Michigan also should bear fruit in this direction. The net result of the work of Professors G. V. Black (*1), Pickerel (*2), and Gies (*3), has been to indicate to us that we can accomplish an enormous amount for our patients by first limiting diet to exactly what we need for our daily regeneration, thus avoiding excessive deposits of calculus, ingesting those foods which tend to produce a salivary fluid inimical to the growth of bacteria, and the use of such fluids and mouth washes which will promote a normal salivary outpour. This to the mind, of the writer is an enor-

*1—Black, in Dental Review 1913.

*2—Pickerel on Decay.

*3—Gies' research report, Journal of Allied Societies.

mously valuable contribution and should never be lost sight of.

The title and scope of this paper does not admit of a lengthy discussion of these phases of the treatment of pyorrhea and prophylaxis, and the author feels in closing his paper, that in order not to create the idea in the minds of this audience that he believes surgical treatment of pyorrhea is the Alpha and Omega of the subject, it should be stated that the powers that make for immunity should be always carefully considered.

I thank you for your kind invitation to appear before you and for the delightful courtesies that I have received at your hands.

ARE ENDAMEBAE IMPORTANT FACTORS IN THE ETIOLOGY OF PYORRHEA ALVEOLARIS?

A STUDY OF THEIR HABITS.

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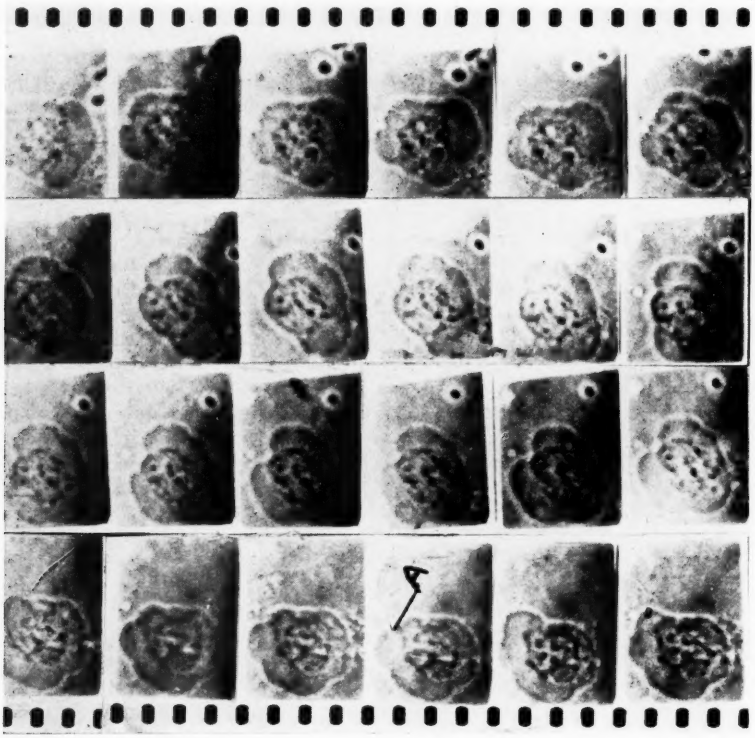
AS DIRECTED, by the Scientific Foundation and Research Commission, this department has been making special investigations to establish methods for the identification and differentiation of pathogenic and non-pathogenic organisms of the mouth and its lesions. This is a preliminary and partial report, made at this time to assist those who are with difficulty, taking up the study of endamebae, to outline some of the as yet unanswered problems relating thereto and to suggest some lines of parallel work for the co-operation of those of the profession who may be in a position to assist in their solution.

The problem that is most vitally concerning the dental profession at this moment is, apparently, the relation of endamebic infection to so called pyorrhea alveolaris and the possibility of its cure with emetine. (1) The microscopic study is one essential line of approach and in order to provide a correct conception of what may be seen in the microscopic field, we will first review the characteristics of the living organisms. We should see and study reproductions of them which reveal their normal individualities, including not only their physical forms but also their natural movements in life's processes. There is as much difference in the appearance of some organisms, when living normally and when dried and stained, as in the swimming swan or the bounding deer when seen at home in their haunts or when their skins are hanging in a tannery. We can learn to identify the swan or the deer by their skins in the tannery or the organisms of the mouth in the stained slide, but we have not learned to know them and their individualities, manners and habits until we have become familiar with them in their natural environments. We have found the motion pictures to be by far the best means for studying the habits of mouth organisms, for by this method we can make them do the same act over and over, with normal rapidity or with any desired slowness. While our studies have included various organisms of the mouth, we will present here chiefly studies of the normal vital motions of the endamebae and their relations to pyorrhea alveolaris. Unfortunately, it is impossible to adequately illustrate in still pictures what is shown in motion pictures, however, a good idea can be gotten by taking out pictures from the series at definite intervals. As indicated, nearly all of these shown are selected at one-half second intervals of time, where the pictures are taken 16 to 20 per minute. In these shown, however, we have en-

larged the organisms to nearly fill the field, especially to illustrate their physical characteristics and their successive rythmic, modulating variations which as seen, are very different with different types and species of entamebae. We find that the

Fig. 1.



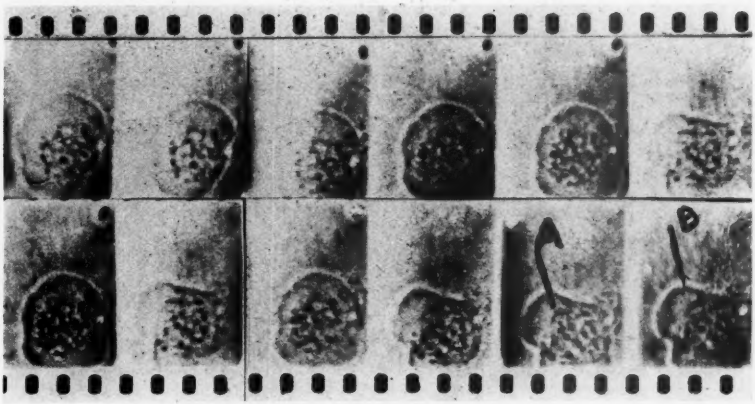
Endameba buccalis. Unstained living organism, showing its motility and progressive changes of pseudopods as recorded at half second periods for twelve seconds. (See text.)

species predominating may vary with the location and the time of the year, in the same mouth under certain conditions, as indicated later. Fig. 1 shows a typical endameba (1) buccalis of Prowazek (1904) (2) which is probably the same as endameba buccalis of Sternberg (1862), (3) the ameba dentalis of Grasse (1879), (4) ameba gingivallis of Gros (1849), (5) and the ameba of Flexner (1892) (6). Chiavaro (7) was the first to recognize its encysted or spore forms. It is present in varying forms in the human mouth under varying conditions referred to later. Its size varies from 6 to 30 microns (one four thousandth to one eight hundredth of an inch in diameter.) When active it throws out a few lobose pseudopods, which have a definite independent tho consecutive movement which is clearly shown in these unstained illustrations from life. This Fig.

1 shows the successive changes that have occurred at the end of each half second for twelve consecutive seconds. Seven pictures have been cut out between each of these. In the upper row of six views you will note that the lower outline remains practically constant, while successive thrusts are made with the wall of the ectosarc first to the left and then upward towards the two erythrocytes. In the second row the upper border shows practically constant, while the thrusts are downward, first toward the right and then toward the left. In the third row the upper border has changed but little, but the thrust is farther towards the left and in the fourth row, while the lower border remains about constant, the motion has been exerted again successively more and more in an upward direction. During this time, the endosarc, including the granular mass within has changed relatively little as shown by the location of its nuclei and ingested material. The red blood corpuscles shown in the three upper rows give a good conception of the relative size of the endameba. With this species the pseudopod is seldom more pointed than shown at A in Fig. 1.

It is suggested by many that the endamebae have a definite phagocytic action and take up bacteria. It is difficult to state what all the ingested matter consists of and also difficult to differentiate it from certain structural parts such as nuclei, which are at times even as large as a leukocyte. Fig. 2 illustrates the appearance of this material especially well. Letter B indicates the stiff short blunt pseudopod with its limiting membrane, and letter A, its glassy hyaline ectoplasm. They have a slightly yellowish tint, giving a color between that of a leukocyte and a red blood cell. Frequently in extra good specimens the ectosarc with its contained protoplasm seems to be relatively large in proportion to its contained granular endosarc and gives the appearance that the latter is floating within it. In these specimens there are usually several very large blunt pseudopods present at once, tho note, as previously stated, only one is motile at a time. These characteristics are shown especially well in Fig. 3.

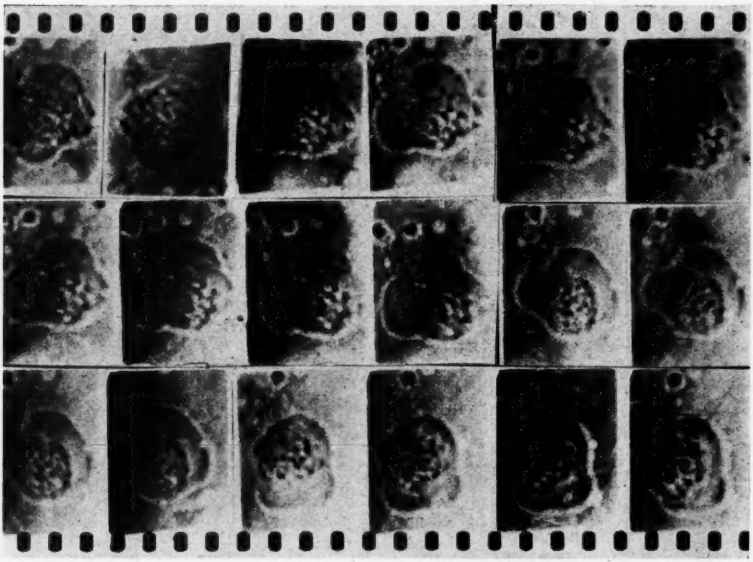
Fig. 2.



Endameba buccalis. Illustrating nuclei, ingested matter and bacteria, also at A and B the ectoplasm and ectosarc. Half second intervals.

It frequently occurs that it is exceedingly difficult to differentiate external foreign matter from the structural parts of the endamebae, because of their being superimposed. This is particularly well illustrated in Fig. 4 where, by knowing that this species, endameba buccalis, does not extend long pseudopods, as this view would seem to indicate we would recognize that the apparent pseudopod is an erythrocyte and some adjoining foreign material. The apparent effect of this is that of a slowly extending pseudopod.

Fig. 3.



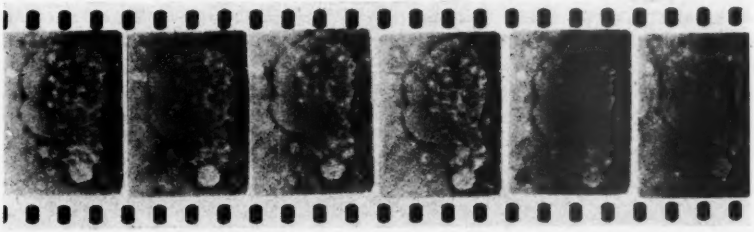
Endameba buccalis. Showing differentiation of endosarc and successive, but single projections of pseudopods. Half second intervals.

The other common species is known as endameba Kartulisi, discovered by Kartulis (8) in Egypt, the morphology of which is distinctly different from the preceding when seen in its natural state, but which, according to the manner of its dying, may take on forms quite unnatural to it in life and which more closely resemble the endameba buccalis. Its form may vary from a narrow worm like structure to nearly or actually round, according to the conditions. When motile it projects a pseudopod in the direction it desires to move and gradually extends this until its ectosarc is in the form of a long loop with its refractile protoplasm practically all in advance of the granular mass.

Figure 5 shows an endameba of this species, starting out on a journey, as seen in the first picture in the upper left. You will note that the condition just spoken of clearly obtains. In the second picture, one-half second later, we see the granular mass flowing within the pseudopod. Unlike the species buccalis, just described, this variety continues its projection almost entirely in one direction, which gives us the effect of a repeatedly extended single pseudopod. It will be noted that at the time the granular mass

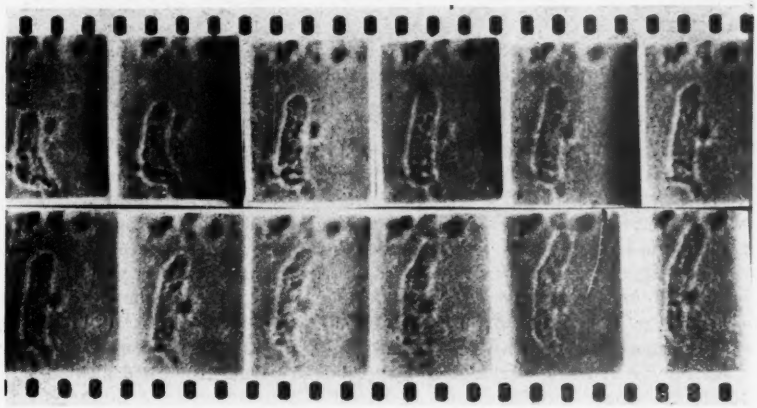
is moving within the ectosarc, there is no motion of the latter and when, as shown in pictures 3 and 4, the pseudopod is moving forward again there is practically no motion of the endosarc and its granular contents. In this variety it is very much more difficult to differentiate the endosarc from the ectosarc, partly because of the migratory nature and habit of the organism. Pictures 4 and 5 illustrate how the least advanced end of the organism has scarcely started to move or change its contour until the mass of the organisms has been moved forward, in other words, it has remained as an anchor to push the other forward. After the organism gets under way, as shown in the second row, particularly in the last two pictures, representing a total of six seconds, it has elongated until it has become a narrow wormlike structure and has practically doubled in length. It should be noted that the organism covers nearly twice the square surface in the last of this series as in the first. This may be due, in a large part, to a

Fig. 4.



Endameba buccalis. Showing relative size to a red blood cell, also a superimposition with foreign material giving the false appearance of a pseudopod. Half second intervals.

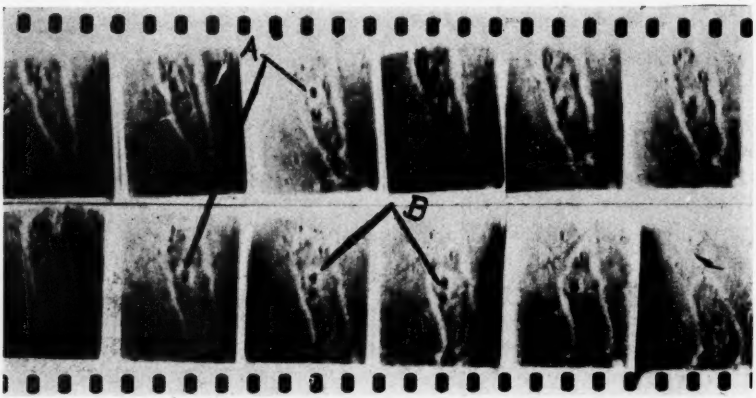
Fig. 5.



Endameba Kartulisi. Showing organism starting on a journey and its progress in six seconds. Half second intervals.

thinning of its depth in the plane of the field, but careful observation has often suggested that the organism actually takes in fluid, thereby distending its ectosarc, or outer limiting membrane, to enable its less plastic endosarc to be more easily moved within it. This species usually has two nuclei, varying in size, besides varying quantities of granular material, which may be bacteria and ingested material, according to the circumstances. It is not definitely known how endameba reproduce, but it is generally supposed that it is by transverse division and by some it is contended that they do so by means of division between the double nuclei. (9) It is significant to note from these illustrations, as shown particularly in figure 6, the clearly defined double nuclei, which clearly differentiates this species from the histolytica found in the colon, which multiplies by fragmentation of the chromatin, the remnant of the nuclei itself being expelled from the cyst. Figure 6 also shows very beautifully, and which often cannot be seen in stained specimens, that the double nuclei are not contained in a constricted limiting sheath. In the first picture they are seen close together and in the second one, one-half second later, one nuclei, has moved forward to a new position, leaving the other in its original location. By one and one-half seconds later, as shown in the 5th picture, the second nucleus has moved up to the location of the first and the rapidity of this motion is clearly indicated by the fact that in the 4th picture they are at about their maximum distance apart and the 5th, one-half second later, they are close together. This motion is very spectacular when seen in the motion pictures, for in each of these series the intervening steps, covered by seven pictures, have been left out. Figure 6 also illustrates the cumbersomeness of the organism, as shown by the difficulty it has in changing its course. In the last picture of the upper row it has decided to change its direction and it moves the mass of its body much as a company of soldiers would be marched around a corner, seldom cutting the corners. The halo surrounding these nuclei, shown with par-

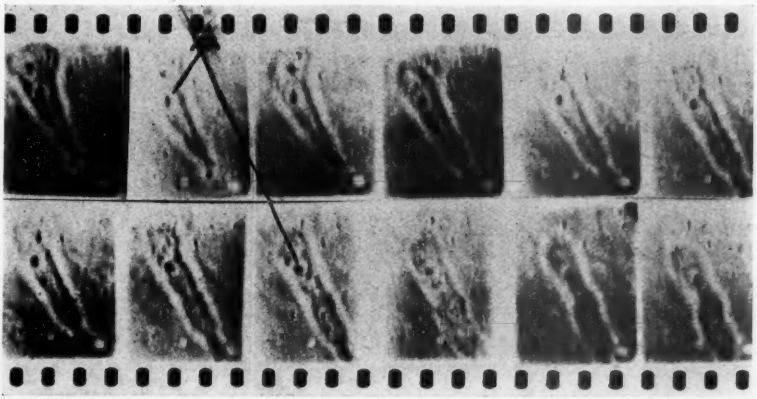
Fig. 6.



Endameba Kartulisi. Showing nuclei and surrounding nourishing vacuoles A and B. See text. Half second intervals.

ticular clearness in letters A and B, are supposed, by some, to be nourishing vacuoles for the nuclei. We have never seen any contractile vacuoles in any species. It is very significant that, in the fixed slides that have come to us from various parts of the country, to be spoken of later, we have seen very few, if any, illustrations of these progressive phenomena, as there seems to be a relaxing of the organism to quite a universal state with death. It is a very frequent experience that when this type of organism is first observed on the slide that it is club shape in form, especially so if seen very quickly after mounting, which suggests that this is a normal poise and one it takes in its natural nourishing process in its habitat. When warmed on the artificial stage it frequently occurs that the organism becomes quite rapidly motile and will quite rapidly migrate across the field. This is particularly well illustrated in figure 7, in the first of which it has that characteristic club shape appearance and in six seconds has gotten under way and has migrated a considerable distance, as measured by the dimension of its own body. In other words, with a combination of lenses giving about 600 magnifications, the organism will cross the field in about three minutes. This figure also shows the migratory movement of the nuclei, spoken of in connection with the previous figure. Figure 8 shows an exceptionally rapid motility, in which in six seconds the organism has moved, virtually, half its own length. This is an unusual motility for this organism. We are all familiar with the fact that the root of a tree, as of a willow, can pass thru an exceedingly fine and torturous opening in a clay tile and expand on the other side to ultimately block the sewer, forming a veritable net work. This property of making its cross section exceedingly narrow and of projecting and dragging itself thru exceedingly fine and torturous openings within the mass of a material, is particularly characteristic of this species, for we have seen it come to an apparently impenetrable blockade and force a hairlike figure into the mass slowly, but forcibly projecting the finger until it has extended a long distance into it, and finally by enlarging the end of the finger and

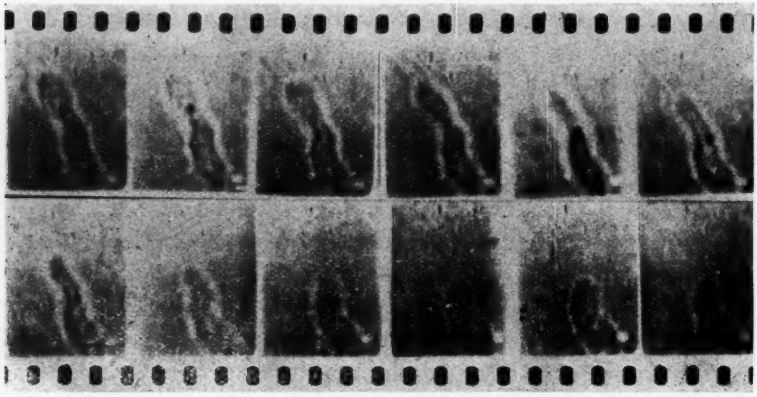
Fig 7.



Endameba Kartulisi. Showing rate of migration. Total time six seconds. Half second intervals.

using it as an anchor to slowly, but surely, drag its body into the meshes, and even tho it has been compelled to elongate itself in almost hairlike structure, it would finally immerge on the other side and assume its original form and proceed on its journey. This is a good illustration of how this organism may enter into and between the cells of living tissues and migrate to various parts of the body, as indicated by the case we speak of later, in which we have actually found it within the human tissue. It is exceedingly interesting that this species seems to dislike greatly to have death overtake it in the open and seems invariably to make for the debris, which may account for many people not finding it in their stained slides. It is also exceedingly interesting to note the great power of this little organism, for we have observed it as it would push itself into a mass of debris and crowd larger bulks of material out of its way. This is also particularly interesting as seen in the motion pictures. It has been quite significant to us that the presence of leptothrix in the patient's mouth is very often an index of the probability of finding the endameba. The reason, however, is not known to us. The association of endameba with leptothrix has also been mentioned by Barrett. (10) It frequently happens that a stained specimen will reveal that the organism has but one nucleus when, in fact, there are two, but they are superimposed. This could not be demonstrated ordinarily but is clearly illustrated in figure 9, in which, in the first picture, we see clearly two distinct nuclei. In the second picture they are becoming superimposed and in the third, fourth and fifth they are superimposed, and had we only the latter we could easily be misled. This figure also shows clearly the apparent ability of the organism to take in fluid and enlarge its mass, for its extending ectosarc, before the beginning of movement of the endosarc or diminution of its size, has presented an increase in volume that it is difficult to account for in any other way. This figure always shows clearly the rate of projection of the pseudopod, the total change here representing three seconds. It should be noted that the nuclei were generally much larger in the encysted or spore forms than in the motile varieties.

Fig. 8.

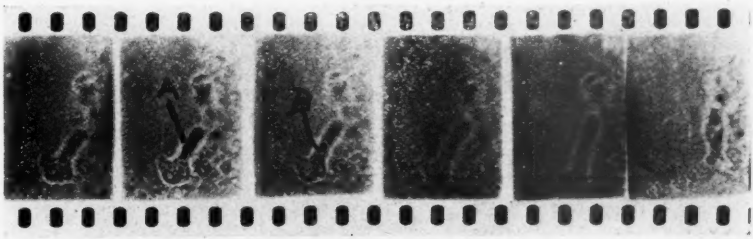


Endameba Kartulisi. Showing unusually rapid migration. Total time six seconds.

The rate of motility of this species, the endameba Kartulisi, corresponds very closely to that of the common garden snail in proportion to its size.

There are motile bacteria and protozoa of the mouth, mostly of the small varieties, that have a speed of locomotion, which, in proportion to their size, would compare with that of the humming bird or the honey bee. We have found an organism in some mouths, the morphology and pathogenicity, of which we have not found in any of the literature, which has a size between that of the erythrocytes or red blood corpuscles and the endamebae and has a motility so great that it can only be kept on the microscopic field by using low powers, by the constant adjustment of the mechanical stage, and it is so transparent as to be scarcely visible with the higher powers. It has a speed of motion probably one hundred times as great as that of the most motile endamebae. Figure 10 shows motion pictures of it, taken at the rate of one per twentieth of a second, there being no pictures cut out as in the former illustrations. In the picture in the upper left hand corner the organism is marked as A and its position is indicated at each succeeding twentieth of a second, and in six-twentieths it has passed entirely off this part of the field. This is shown here under a low power, approximately 400 diameters. A relative conception of its motility, in proportion to its size, can be obtained by comparing it to the speed of a dog, or equivalent to that of a man running at the rate of 12 to 15 miles an hour. This organism has cillia and a contractile vacuole and is probably a paramaecium. It is spoken of later in this paper in connection with a practical case. We have only found this organism in mouths with a prolific growth of motile mouth flora. It must be seen either in the microscopic field or in motion pictures to be appreciated.

Fig. 9.



Endameba Kartulisi. Showing two nuclei becoming superimposed and plowing into pseudopod. Also apparent extension of ectosarc.

SOME IMPORTANT CONDITIONS IN THE ENDAMEBA AND EMETINE PROBLEMS THAT ARE NOT AS YET SATISFIED.

Are endamebae directly related as a causative factor in so called pyorrhea alveolaris, and will emetine treatment cure the disease? There are many evidences to indicate that the answer should be affirmative, among them the following:

Favorable Evidence.

1. The statements made by skilled bacteriologists (11) of known exceptional ability and world reputation.

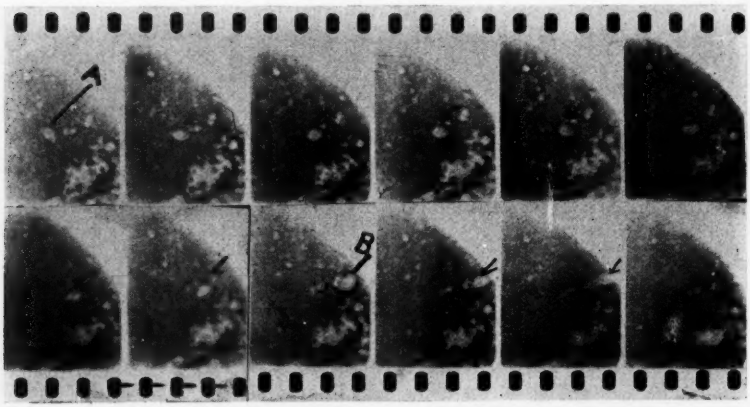
2. The history of certain varieties of endameba and their known relation to other lesions, (12) as for example, endamebic dysentery (13) of warm climates and its cure with emetine treatment.

3. Their frequent presence in pyor-

rhea alveolaris pockets, (7) At this point we wish to state that in order to enlarge the field of clinical observation we have been in correspondence with the Presidents of the various state societies of the United States and with prominent dental pathologists of the United States, Canada, Mexico, Cuba and Puerto Rico, and have had smears made and fixt on slides furnished by us, in these various localities and have stained them here under uniform conditions. We have also had the presidents of the various state societies select for us a half a dozen of the dental pathologists of their state to co-operate with us in making observations. Correspondence with these two groups of men and the study of their slides indicate that, in the type of cases that have been selected by them for the smears, the presence of the endameba is almost universal at the time of and the conditions under which the observations were made. There are, apparently, few exceptions, which will be taken up later under the evidence against the endamebic etiology of pyorrhea.

4. Many observers in various parts of the country report that the use of emetine, as an amebicide, has either greatly improved or, according to their standards, has cured the pyorrhea alveolaris. (14) As an illustration of some of the correspondence, I quote from three of the letters. (a) "I have been using this treatment (emetine) now for two weeks or more, having treated about sixteen cases, and have gotten excellent results. Among this number I have absolutely cured five cases. The balance are still under treatment." (b) "I have been using the emetine since September last and would say that with one exception I have had the best results. I have used it by the stomach, subcutaneously, and by flooding the pockets, and have had gratifying results in all but one case, but in many of them I have had to be very persistent when, no doubt, others would have given up hope, etc." (c) "In regard to the results of the emetine treatment would say that with but one exception I have had very gratifying outcomes. Some cases, of course, yielded more than

Fig. 10.



A Cilliated Protozoan. Recently observed. Showing its extreme motility, which is probably 100 times that of the endameba. Intervals between views, one-twentieth of a second. Total time crossing this field, twelve twentieths of a second. It is usually larger than a leucocyte.

others and some are, apparently, entirely well. The case that refused to yield was one on which I have also used autogenous vaccine with negative results." Several of the other correspondents state that the emetine treatment is frequently, or generally, successful in improving, either in part or very materially, the condition, tho very few refer to them as being cured.

5. The authors of this report have found an endameba on the apex of a root that had been extracted where the pyorrhea pockets of the mouth did not show endameba, and while it is possible that the sterilization about the teeth was not perfect enough to prevent the contamination of the root end at the time of its withdrawal thru the tissue, the fact that sterilization was used and that the root apex was very conical and that the smear was taken from the very tip, strongly suggests that the organism was an inhabitant of the tissue about the apex.

6. The authors have also found three very motile endamebae of the Kartulisi variety in the blood of an extirpated pulp, which operation was done under novocain. The pulp was exposed mechanically, accidentally, after the removal of a poorly fitting gold crown. The exposure was covered with calxine cement for one week. We believe there was no possibility of the organism entering the tooth thru the artificial opening made into the pulp chamber unless it past thru the cement. This patient is suffering from an obscure irritation of an old heart lesion. This is a very significant finding and, so far as we know, the first time an endameba has been found in the tissues of the mouth, and suggests pathogenic nature of the Kartulisi variety.

7. It is possible that there is some metabolic that is produced by the endameba, which exerts an enzymic action.

Evidences against the endamebic etiology of pyorrhea and the treatment of the disease with emetine.

1. The statements of skilled bacteriologists, mostly specializing in dental pathology are that, while they find the endameba present, they do not consider it an important causative factor. (15).

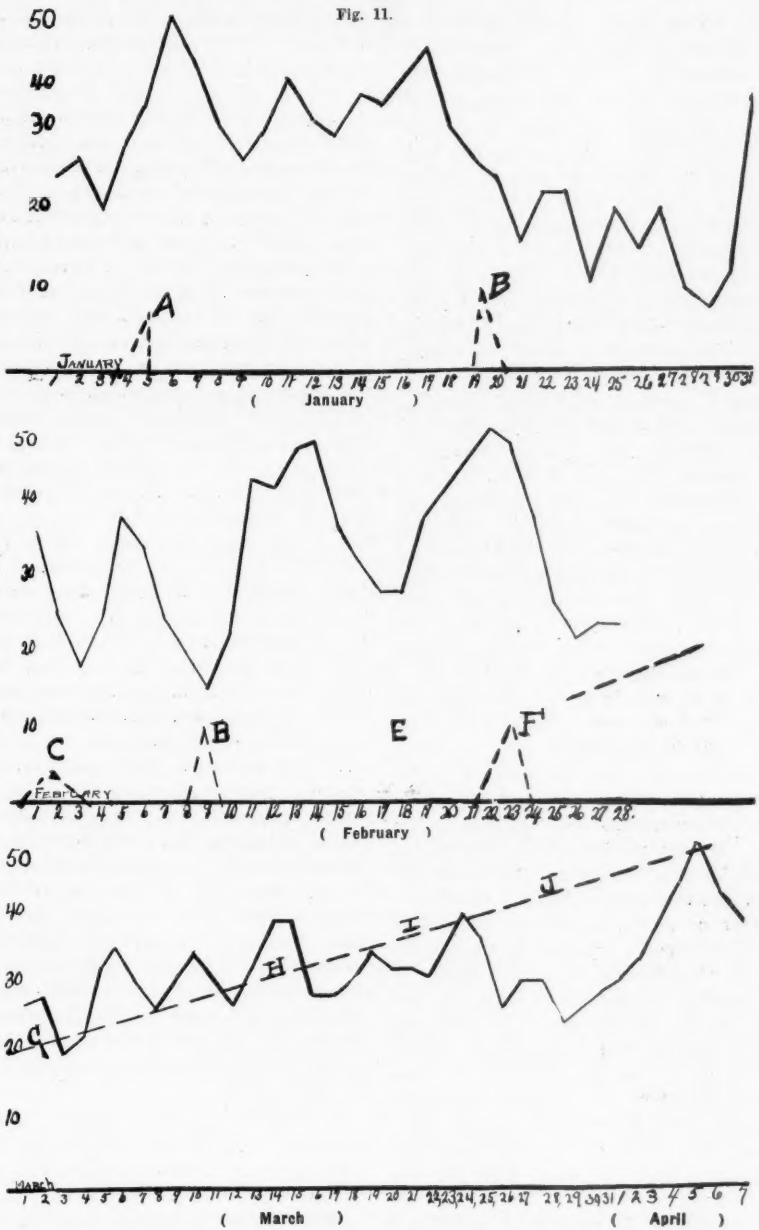
2. The correspondence (16) with selected observers from different parts of the country shows the majority of them to be very conservative and reluctant to claim much benefit from the emetine treatment and some are strongly negative. I quote the following: (a) "My clinical experiments show that the treatment by emetine is not what it is 'cracked up' to be. I have tried it in every way possible in all kinds of cases and my experience is the same as in autogenous vaccination, that is that it does no good unless thoro instrumentation has first been accomplished and then it is not necessary. Proper surgical work is what does the work and is a great deal better than the emetine treatment, etc." (b) "You ask for general observations as to the endameba. I will say that in the mouths I have found them I do not find them after I have carried out my thoro pyorrhea and prophylactic work, and this without the use of any drugs, whatever. I have used the emetine religiously and have found no results from its use in addition to results I obtained without it." We would also refer you to another paper published in this department of the Journal, which directly discusses this question. In the correspondence received 11% have been positively against the use of emetine, 47% conservative and noncommittal, in other words still earnestly studying its effects, and 42% are favorable to its use, generally in conjunction with thoro instrumentation.

3. A few observers, including ourselves, have not found the ameba present in certain cases before treatment with emetine and have found it in those

same cases shortly after treatment. This we will discuss later.

4. Many observers, including ourselves, have found many cases of typical so-called pyorrhea alveolaris lesions which, during the period in which the observations were made, did not, at any time, show endameba. If they were present they could not be found. In one very typical case, in a mouth where several of the teeth had been lost by this disease and where another was badly affected and loose, also to be sacrificed, exhaustive studies were made to locate at least one endameba or spore. Numerous slides were made on each of seven days during November, five days during December and four days during January, in all at least one hundred slides, both by examining directly and by staining, and in no case could the organism be found. The badly infected tooth was then extracted. Emetine treatment was used in the mouth wash during February and March and on April 1st the patient was again examined and, altho her mouth was in excellent condition, endamebae were found in the first slide and in other slides made from different parts of her mouth. Another patient was examined for endameba about the pyorrhetic teeth, some of which could be nearly removed with the fingers, several times during each November, December, January and February, and they were not found. In March the organisms were found even after the several badly affected teeth had been extracted, and the mouth put in good condition. These cases are typical of a number that were examined during both the Winter and Spring months, and which did not reveal the endameba during the Winter except at certain brief periods, if at all, until the spring days. This strongly suggested the relation of temperature or water supply to the varying presence of the organism. It is significant that a large proportion of the cases of true pyorrhea alveolaris do not have even a visible amount of pus present, which is one of the reasons that our profession has been striving, so diligently for decades, to find a name that was adaptable to the disease in its various stages and conditions. I am advised that about twenty different names have been presented as being adequate to correctly identify this lesion. It has been the experience of the authors that during the months of November, December and January, particularly the latter two, the cases showing endameba were, almost universally, those with a liberal amount of pus present, while those of February, March and April, particularly the latter periods, showed the organism in a great majority of cases, whether an abundance of pus was present or not. We have examined approximately fifteen hundred slides of our own, besides approximately one hundred and fifty furnished by the presidents of the various state societies of the Union and by dental pathologists in various cities, and have carefully tabulated the data. Unfortunately, no slides have been furnished us that were made earlier than the latter part of February, most of them during March and, consequently, they do not check against our data going back into previous months. For another reason they are not comparable, namely, that they presumedly have been almost all made from those cases of pyorrhea that had a liberal amount of pus flowing, in fact the case reports, kindly provided with the slides, stated this fact in nearly all instances. We have made into a chart form (See figure 11) some of the data revealed by this large series of records and related them to the average temperatures for January, February, March and to April 7th. The heavy, straight, horizontal base line represents zero temperature, with the dates recorded below it, and the elevation represents temperature, Fahrenheit, shown by the zigzag curve. It is exceedingly interesting to note that the points marked A, B,

Fig. 11.



Curves showing relation of varying presence of endameba to mean atmospheric temperature. (See text.)

C, D, F, and the ascending line thru J represents the increasing frequency of the endameba in pyorrhetic people, and from No. F to and thru J, where the line is marked continuously on the ascension, a large number of people who have no pyorrhetic lesions have the endameba present. In several cases children with splendid healthy mouths are showing them. The points A and B in January and C, D and F in February are particularly instructive, for at these times there was a sudden sharp increase in the presence of endamebic infections, and it will be noted that these correspond to periods immediately following, by a few days, a rise of temperature. At these periods there was a decrease in the number of spores with an increase in the number of motile endameba, suggesting a period of incubation following the rise of temperature. Circumstances prevented us from making observations at the dates corresponding to E, which is the only break in the record. It is also significant that cultures we had planted to receive and grow air ameba during the winter did not show them until the ameba line was well in ascent about the first of March, tho the condition have remained constant even as to the temperature of the inside room where the culture medias were exposed to the air. It was particularly interesting to note, in this connection, that when we wrote to one of our friends, a skilled observer of mouth conditions, requesting that he observe whether or not in his locality there was the same relation of endameba to temperature changes that he replied, "I was amused at your enquiry regarding the greater prevalence of endameba in our cases of pyorrhea since the change in weather, because of the fact that for the past three weeks practically every case of pyorrhea that we had, seems to show more or less abundance of endameba. I had not attributed it to the weather so much as I had to the fortuity of the cases which we happened to see, etc." It was known to the writer that this observer had not found them so plentiful in the mid-winter months as in the Fall. We will be very glad to know the experience of other observers who have been looking for the endameba during the Fall, Winter and Spring and, if possible, to have the accompanying data of the relation of these conditions to the average temperatures preceding. It is not clear what the causative factor is since the temperature of the mouth must remain about constant, irrespective of the climatic conditions, nor is it clear where the organisms are sojourning in the interims when they seem to be absent from these particular cases. The correspondence with the large number of observers indicates that they probably are not related to the water supply, altho at one time in January all of the cases of the authors in which they were found to be present were using water from springs outside the city. It should be stated, in this connection, that the only slides we have received from the various observers in the different parts of the country, who prepared them for us according to our directions, which did not show endameba were made in the northern part of the country the latter part of February. An important fact obtained with regard to the presence or non-presence of the entamebic infections in the cases, herewith sighted, in relation to temperature changes, namely, that there was no apparent difference in the nature or systemic effect, by any means that we could determine, when the organisms were abundantly present or were not present in the same mouth, tho the variation ranged from zero to a prolific number.

5. Another argument against the endamebic origin of this infection is the relation of systemic disturbances to the presence of the organisms. During these months we have studied cases of the most profound systemic expression, and

in which the general symptoms responded to treatment of pyorrhea, but in which cases no endamebae were found before and during the period of treatment, while the patient was suffering systematically, and yet after a thoro treatment and after subsidence of the symptoms, the endameba appeared without any return of the symptoms. These were chiefly non-suppurative cases of pyorrhea and in all probability would have been overlooked by all except very observing dental pathologists. The mouth lesions were relatively very insignificant.

6. The effect of emetine on other micro-organisms. Emetine Hydrochlorid has a profound action on other micro-organisms, including the various varieties found in the mouth, which effect is almost as striking in many instances as its action on the endamebae, and granting, as there is abundance of evidence, that, in many cases, the emetine has positive beneficial effects, both on the local and the systemic conditions, whether injected intravenously, subcutaneously, or in the pyorrhea pockets, it is not established that its beneficial effects are, in a part or whole, not due to its action on these other organisms rather than the endameba. It is particularly to be regretted that this point has been almost entirely overlooked in the writing of the literature that has been published relative to the endamebic infections. There are exceptions, however, namely the discussion of Curet of New Orleans, (17) in which he says "that 1-10 per cent solution of emetine hinders perceptibly, in thirty minutes, the growth of a 24 hour culture of diphtheria and streptococcus mucosus. In one hour's time it lessens considerably the growth of streptococcus pyogenes, and in 12 hour's time that of staphylococcus citreus. It kills B. diphtheriae and streptococcus mucous in one hour and staphylococcus citreus in 12 hours' time." Wherry, (18) of Cincinnati Hospital, who has found that emetine one to 50 thousand killed ameba and one to 100 thousand paramaecium and balantidium. De-emetinized ipecac failed to kill one to 5 thousand. Veqer, who found when two per cent of fluid extract of ipecac was mixt with agar, it exerted marked inhibitive and germicidal action on B. typhosus, B. paratyphosus, B. dysenteriae and staphylococcus pyogenes aureus. This is important when one considers the like role played by symbiotic bacteria in amebic lesions. The researches of the authors on this point to determine the germicidal and inhibitive action of ipecac and its products, emetine and cephaline, have demonstrated that the organisms taken from pyorrhea pockets are very directly influenced by these drugs, particularly the emetine. Ipecac, from which these two alkaloids have been extracted, has very little, if any, germicidal action. Emetine in solutions up to one to 10 thousand inhibits the growth of these organisms, besides having marked germicidal action upon them. Cephaline has also marked germicidal and amebicidal properties, but not to the extent that emetine has. An interesting experiment that any one can make very easily is to expose various culture media to the air contamination. So small an amount of emetine as a loop full to 5 C. C. of media will have the effect of preventing the growth of these organisms for 24 hours, at which time the controls will have a profuse growth.

There is much clinical evidence to indicate that the beneficial influence of emetine is due to its effect on other micro-organisms that the endameba. We sight one of several cases in detail. A man of good habits and good history, about forty years of age, had suffered for months with recurring extreme headaches lasting from two to three days and so severe as to put him to bed. His vision was disturbed with what he called liver spots. These attacks recurred at varying intervals at from two to three

weeks and were getting slowly, but progressively, worse. All conceivable means had been resorted to in good medical practise, without more than temporary relief. Accompanying these attacks there was considerable distress in the liver and a digestive disturbance. Frequent examinations of his mouth during November, December, January and February for endameba were negative, altho a great many slides were made. Careful examination of the gingival tissues showed a couple of small pyorrhea pockets and the lingual root of the upper right first molar was almost entirely denuded of its attachment. We could not, at that time, get the slightest showing of pus. The cultures from the pockets showed a prolific growth of an organism which, for the present we will call X. Since the attachment of the other two roots of this tooth were excellent, the lingual root was amputated close to the crown, but before doing so animals were inoculated with the cultures aspirated from this pocket. We were able to recover the organism in question daily for several days from the blood of the tail of a rat inoculated. Within a month the rat died with multiple miliary abscesses of the liver, both macroscopic and microscopic. These abscesses produced a pure culture of the organism, which only lived 24 hours in artificial media. This organism would not grow at any time in artificial media. Other animals inoculated with the same culture, directly from this rat, died with similar lesions. Immediately following the amputation of this root the patient had an attack of his recurrent headache and digestive disturbance, which, however, was slightly different from former attacks, particularly in the rapidity and extent of his recovery. A thoro instrumentation was done on all his teeth. About three weeks later, January 8th, after he had had a recurring attack of his original disturbing symptoms, we started the emetine treatment, which consisted of injecting a small quantity of emetine into the pockets and into the tissue surrounding the socket where we had amputated the root. On January 15th we made the following record in our notes. "Since last appearance (January 8) patient has had recurrents of old symptoms without liver spots in eyes. Extreme pain like neuralgia started in the temple and extended successively thru the area supplied by the trifacial until it involved all its branches. The pain was so severe that a physician was called and gave him sedatives. The attack started mildly on Friday evening, the day of our injection with emetine, and became gradually worse, reaching the climax on Monday morning, January 11th. His recovery was very rapid, so much so as to greatly impress him and when seen on this Wednesday, the 15th, he is feeling unusually well." This clinical picture and reaction was repeated with diminishing intensity after each treatment, with emetine, whether by flushing the pockets or by subcutaneous injection into the arm, and with such regularity that the patient dreaded the treatments because of their after effects. On February 9th the treatment was made into the pockets with flavored normal salt solution, unknown to the patient, and he waited in dread for the oncoming reaction, which, he cheerfully reported by phone on the following morning, had not materialized. The bacterial growth in the pockets was greatly modified by emetine treatments. Suddenly the patient ceased to have any reaction after the emetine injections, since which time he has been receiving one injection each week or two. Since the emetine ceased to cause reaction, he has not had a single recurrence of his digestive or neuralgia and headache troubles. He washes the pockets daily with a syringe, using 1-10 per cent. solution of emetine. He has gained in weight and is feeling better than any time for a year. Let me

recall that during November, December, January and February, diligent search did not reveal either the endameba or spores. In four days during March, and one already in April, he has been examined for the presence of endameba and on every occasion but one both spores and actively motile endameba have been found. The organism we have referred to as X has almost disappeared from these pockets. If space permitted we would present two other case histories, which are quite as striking as the above in illustration of the fact that emetine does have an effect in certain cases and, apparently, there has not been found endameba. One of these patients is now attending business eight hours daily, and had not previously more than a couple of hours a day, if at all, for six months and tho in the prime of life was completely discouraged. It should be stated in this connection that our experience in injecting emetine subcutaneously into healthy people is that it produces no reaction except a local soreness in the doses used in the above cases.

7. The special work of Noguchi (22) on the spirochaeta, treponema mucosum strongly suggests its relation to the pathogenic processes involved in pyorrhea alveolaris.

8. The progressive pathology of the lesion, known as pyorrhea alveolaris, as it is understood by our most competent students, is one of the strongest arguments against the proposition that the lesion has, as its chief etiological factor, an endamebic infection or that the disease can be cured by injections of emetine. It is an exceedingly significant circumstance that the dental pathologists, who have been spending decades, or the most of a lifetime, in the study of the pathology and etiology of this lesion, are practically unanimous in the belief that the disease will not be cured by the injection of any medicament, nor do they consider the fact of stopping the flow of pus as being in any sense a cure for the disease, since many procedures have been known to be competent to accomplish that change in the expression of the disease, but always with the tendency to recurrence but never with the complete obliteration of the lesion itself. The very form of nature's method of attachment to the root wall is dependent upon a vital cementoblast with its normal vital attachment to the cementum. When these cementoblasts have lost their life the possibility of a reattachment seems to be so remote, according to many of our best authorities, as to be considered practically an impossibility. The treatment that has given most uniform good results has had, as its basis, the surgical treatment of an infected wound and the stimulation of the circulation with protection from a reinfection. One of the authors of this paper has searched diligently for 20 years to find a single instance where a definitely developed pyorrhea pocket with destruction of the alveolar wall had actually produced a reattachment to the tooth wall, and in that time has seen but one case and in that case the onset of the disease was very acute and sudden. The necrotic bone was cut with a bur from the necrotic alveolus and, as nearly as possible a surgical condition observed, with the result that there seems to have been a perfect reattachment and in this case it is probable that the cementoblasts had not yet died but were still vital. We have seen other cases where the alveolus had grown so tightly around the root that it seemed to be ankylosed but we could not convince ourselves it was anything more than a close adaptation of the new bone to the tooth root.

An important phase of pyorrhea alveolaris lesions is the systemic involvement and it is a matter of extreme importance that exhaustive researches should be made to determine whether or

not the systemic expressions, as illustrated in the case sighted above, are the direct effects of toxins produced by the organisms or the irritations of proteins of bacterial origin that have been set free either by medication of instrumentation. Also, whether the bacterial protein or toxin, if such are producing the lesions, are set free from the bacteria by the action of the endameba. In support of this latter we have the splendid work of Evans, Middleton and Smith. (19) They explain the local reaction following the emetine injection as an index of a point of saturation when, with the death of numerous endameba, the lethal point of emetine has been reached and a great amount of bacteria, and possibly amebic toxin, is liberated. Smith, Middleton and Barrett, (20) in their splendid work on amebic infections of tonsils and their systemic conditions, suggest that the bacterial phagocytic action of the ameba probably set free in the system various endotoxins depending upon the kinds of ingested bacteria. It probably is not generally known, to those of other lines of practise and study than the treatment of teeth, that many patients are so sensitive to the indirect effects of instrumentation of pyorrhetic pockets that but a few teeth can be treated at a time without profound reaction, resembling, in many cases, a protein poisoning. This is illustrated by the following case. A young married woman, otherwise physically strong, suffered from extreme depression and lassitude with digestive disturbance and headache, and worthy efforts were made to relieve these with good medical procedure. The mouth showed non-suppurative, shallow pyorrhetic pockets with very slight local irritation and causing no personal discomfort. Recognizing the clinical picture, which is quite frequent, in the hands of all who are specializing in the treatment of this disease, we advised that only a small part of the instrumentation of removing the infecting and culturing masses and irritating deposits be undertaken at the first sitting. She was advised to watch for a reaction and report the next day by phone. The next day her symptoms were so extremely aggravated that she stayed in bed, and altho the phone was but a few feet from her she undertook to reach it and carry out her instructions to report, but she fell back wearily, stating "Oh well, he knows I am sick, for he told me I would be, and what is the use of reporting." This reaction recurred after each successive instrumentation, but with diminishing severity, and with no other treatment she is relieved of all her unfavorable symptoms and is, apparently, in perfect health again. Had emetine been used, it surely would have gotten the credit but nothing was done but the removal of the irritants and the culturing deposits about the teeth. Data of treatment and history of this type of case, of which there are many, should be carefully collected since they strongly indicate a bacterial protein poisoning. Beside the usual bacterial mouth organisms, consisting largely of spirochaeta, there was found in this mouth an organism similar to that shown in figure No. 10, which, as described, is probably 100 times more motile than the endamebae, in fact it is so motile that it is difficult to keep it on the field with powers high enough to study it well. It is not an endameba but is probably a cilliated protozeat a paramaecium about the size of a leukocyte. We have only found this organism in a small per cent of the cases.

9. Another argument against the conclusion that endamebae are the causative factor in the production of the lesions we know as pyorrhea alveolaris is found in the following:

Emetine has a well established effect on some special lesions of the body that have not been suggested as being caused by endamebic infection. The illustra-

tion of this is found in the fact that quite accidently it has been discovered by two different dentists that one of the most difficult of all known diseases of the skin to cure, namely; psoriasis has been found to disappear, and the skin to return to an apparently quite normal condition as an incidental effect of the use of emetine in the treatment of pyorrhea. So far as we know, no work has been done as yet to determine whether or not patients suffering from this disease have endamebic infection of their mouths. This should be done. One of these cases is reported in detail by Wm. R. Chaplin, D. D. S., Savannah, Georgia, in the February number of the Dental Cosmos, (Volume 57, No. 2, page 289.) In his case the patient had suffered for fifteen years from psoriasis. He says, "The backs of both hands were completely covered with most repulsive looking inflamed, somewhat corrugated, scaly surfaces. This condition was also found in large patches on both arms and on some parts of the body. The disorder has been many times diagnosed psoriasis." He treated the patient with emetine hydrochlorid according to the method as advocated by the Drs. Barrett and Smith, including instrumentation. After describing the case in detail, he states, "At the present time six treatments have been given—and it now being two weeks since last treatment—every symptom of psoriasis has entirely disappeared.

Another report of a similar case has just come to us in a letter from Dr. J. W. Smoots, President South Dakota State Dental Society, Spearfish, South Dakota, in which he gives in parts the description of an experience, he has had.

Referring to his patent, he says: "She had one finger of one hand particularly in bad shape from psoriasis, and as I had just received some P. D. & Co.'s Emetine Hydrochlorid and the physician had called me in, I advised the use of the above treatment. She has had four treatments in the last ten days and yesterday her hands seemed to be nearly normal but could not report her case cured until she has been under observation longer."

This is of very great significance, not only because of the discovery of this new treatment for this painful and humiliating affliction, which has seemed to be practically incurable, but it suggests strongly a larger application for emetine than that of an amebicide, the inference of which can be that the beneficial effect, of emetine in the treatment of pyorrhea is due rather to its effect on other organisms than on endameba.

10. Another argument against the endamebic cause of pyorrhea is the important recent discovery that succinimid of mercury seems to have not only a specific action on the treponema pallidium, the specific organism of syphilis, but also quite as striking a curative effect on pyorrhea alveolaris as emetine. This has been discovered and emphasized by White and Wright. (20).

It has not been suggested that this drug is in any way specific for endameba and it will seem very possible that its beneficial effect on pyorrhea could be explained on the assumption that the causative factor is a spirochaeta or some other vegetative organism. This conception is further supported by the fact that Noguchi has emphasized the possibility that pyorrhea alveolaris is caused by the spirochaeta, treponema mucosum, which has already been referred to in another part of this paper. (21).

The possibility of injury to the patient from hypodermic injection. We must recognize that there is a constant danger in breaking Nature's seal of our own bodies and of causing the entrance into the body of infections. This includes not only the dangers from pathogenic bacteria but the sensitizing of the body to proteins and the distressing effects of later introductions of that same protein, whether carried in solution by the medi-

cament or its effect on bacterial growth. An additional danger seems to have arisen by the causing of a more or less serious paralysis. We have just been informed of a case, where emetine was injected into the shoulder with the result of producing a partial paralysis of the arm lasting two days. We have not as yet received the full particulars. The authors have also seen a case of local necrosis of the alveolus from the injection of a few minims of a ½ of a 1% emetin hydrochlorid solution in the gums around a pyorrhea pocket.

CONCLUSIONS.

Owing to the fact that the evidence is largely circumstantial, which has indicated that endamebae are the chief causative factor in pyorrhea alveolaris, based, in a great part, on the known bad reputation of its cousin's species, the endameba histolytica of amebic dysentery, and since the evidence against this conclusion is in great part incomplete, we strongly urge the withholding of judgment until further researches shall have established sufficient of the following data.

1. The successful production of the lesions of pyorrhea alveolaris by inoculation with endameba, according to Koch's law, namely, (a) an organism, if it causes the disease, must be present in all cases, (b) the organism shall be isolated in pure culture, (c) a pure culture, if inoculated into a susceptible animal, must produce the disease, (d) the chemical products must produce the same alterations.

2. Or, the successful production of the lesions by inoculation with some other organism, or organisms, or by some other means.

3. Or, the demonstration that the endamebae of the mouth are non-pathogenic and are incidental or helpful inhabitants of the oral cavity as scavengers; not only harmless of themselves, but not producing either toxins or harmful enzymes.

4. If the endameba buccalis is the chief causative factor in pyorrhea alveolaris why is the endameba Kartulisi found alone is so many of the typical cases?

5. The establishment of the role of emetine, including a close differentiation between its amebicidal and its bactericidal actions.

6. A determination as to whether the beneficial action of emetine is that of an amboceptor, acting upon the bacteria or protozoa with their protein and toxin contents (the toxiphor group) thru the agency of the complement, and also whether the action of emetine is that of a complement as in the case of lecithin with snake venomen. (22).

7. A determination as to what is involved in so-called bacteremia, which is clinically so common as a result of instrumentation and of certain medications and is this action bacteremic, septicemic or toxemic.

8. The establishment of the precise local tissue changes involved in the development of the lesion of pyorrhea alveolaris and of the successive processes constituting its repair.

9. The establishment of the precise role served by instrumentation in the process of repair of pyorrhetic lesions and the significance in this process of the removal of foreign material, bacterial plaques and degenerating tissue, also of polished surfaces, local stimulation of circulation by frequent massage, etc.

10. The development of a means for the reattachment of vital tissue to dead and denuded cemental surfaces of roots.

11. The establishment of the role of pyorrhea alveolaris pockets as culturing places for pathogenic organisms, as those of the streptococcus-pneumococcus group, which from this lesion as a primary focus, affect other organs and tissues of the body, and the establishment of the symbiotic effects of the organisms on each other.

12. Granting that the endameba is the causative factor of pyorrhea alveolaris and that emetine hydrochlorid is a specific for it, why has no pyorrhea pocket, of the many cases treated by the authors, been more greatly modified in the way of repair than the more or less marked improvement of the following factors: the quantity of pus flowing; the relative quantity of micro-organisms growing in the pockets and the general tonicity of the surrounding connective tissues, with practically no considerable change within several months of the bone lesion itself surrounding the tooth.

13. And chiefly, by the establishment of a mass of circumstantial evidence, bearing on the above and related problems, which shall be so carefully interpreted and tabulated that it will indicate the probable answers to most all of the above questions, before they can be clinically and technically established. This will best be done by as large a number of skilled observers as possible, including those skillfully treating pyorrhea alveolaris, either as a local lesion, as a systemic lesion, or as both; those treating other diseases primarily but also observing, competently, the effects on local mouth lesion and those studying by intensive methods in pathological and bacteriological laboratories, etc., etc., sending reliable statements of their observations and findings to some central committee or organization, such as the Research Commission of the National Dental Association, for classification and publication, a considerable quantity of which has already been received.

We would suggest the following simple technic for those who are not familiar with detailed procedure. Take a suitable half round instrument like a scaler, or a smooth tapered toothpick, preferably the hardwood Japanese pointed toothpick, and with it remove some of the contents from the suspected pyorrhea pocket, being careful not to produce a hemorrhage of the gingival tissue, for the blood cells will greatly interfere with the observations of the endameba and other organisms. Place a small drop of warm normal salt solution on a warm slide, and without allowing the temperature to change, carefully dissolve the material carried on the instrument or toothpick in the normal salt solution, being careful not to grind up the organisms unduly. We do not advise the use of the so-called hanging drop slides but prefer a plain 3x1 inch slide and a square thin cover slip, ¾ inch. Lay the cover slip on the drop of water, after the solid matter has been pushed to one side, leaving mostly stained liquid. After placing the cover slip in position make slight pressure to reduce the layer of fluid to an even strata. Dry off around the cover slip and while keeping the slide warm, quickly heat the end of a piece of sticky wax, such as S. S. White's Orange Sticky Wax, and run a thin layer of the hot wax along each of the four sides of the cover slip. This prevents currents in the fluid from air drafts, also the changes due to surface tension of the fluid, as well as the evaporation, and if the microscope is kept in a warm place the endameba and mouth organisms will usually stay alive for hours, not infrequently for half a day, if the warm stage is used on the microscope, and for an hour or two without the warm stage if the microscope is in a warm place. It is desirable to have the warm stage temperature slightly higher than body heat. By referring to the illustrations of the various forms taken of the endameba previously presented in this article, you will readily recognize these organisms by the fact that they are usually larger than the erythrocytes or the leukocytes and have peculiarly refractile areas or pseudopods resembling segments of disks of paraffine or wax, when in the motile stages and characteristic granular centers in the resting or spore stages. The endameba buccalis is much less motile than the endameba Kartulisi, the former throwing out lobose pseudo-

pods in various directions, usually only one being in motion at a time, while the latter usually extends an armlike pseudopod carrying forward its ectosarc and then proceeding to flow its endosarc with its granular masses and nuclei into this elongated pseudopod, producing a flowing motion within itself, usually in a definite direction, as shown in the illustrations.

For fixing and staining we would recommend the following technic and procedure. The following three methods we have chosen to be best for fixing specimens:

1. A solution suggested by Schaudin, (24) which is made by adding 50 C. C. of absolute alcohol and 5 drops of glacial acetic acid to 100 C. C. of saturated bichlorid of mercury. A wet smear is dropt into this solution for ten minutes. Wash for ten minutes in a little alcohol containing a little iodine and then in 70% alcohol for thirty to forty minutes.

2. A method suggested by Dr. Hartzell, which is to drop a wet smear into saturated bichlorid for thirty minutes.

3. Pass an air dried smear thru a flame.

There are also three good methods for staining. In using Heidenhain's Iron Hematoxylin (25) the specimen must be fixed in either of the first two solutions above mentioned. The stain is prepared by dissolving one gram of Hematoxylin crystals in 10 C. C. of hot absolute alcohol and then adding 90 C. C. of water. This solution is allowed to stand in an open, cotton plugged, bottle for four weeks and is then diluted with an equal volume of water before using. The iron solution is made by dissolving 2.5 grams of Ferric Ammonium Sulphate in 100 C. C. of distilled water. The fixt specimen to be stained is first soaked in the iron solution from four to eight hours, then rinsed and immersed in the Hematoxylin from 12 to 24 hours. It is again rinsed and differentiated by immersion in the iron solution until black clouds cease to be given off. With this method the endosarc is well differentiated, while the ectosarc is recognized by the absence of the stain. Drs. Bass and Johns (26) have recently suggested a stain for ameba, which can be carried out and examined almost immediately after the specimen is taken, consisting of dipping the specimen in carbofuchsin, which is prepared by dissolving one gram of fuchsin and 10 C. C. of absolute alcohol and then adding 5 grams of carbolic acid crystals. To this mixture add 100 C. C. of distilled water. Leave for 24 hours and filter. The carbofuchsin is immediately washed off and the specimen differentiated in a solution of Loeffler's Methylene Blue. To 30 C. C. of alcoholic solution of Methylene Blue add 100 C. C. of one in one thousand of Aqueous solution of Caustic Potash. The specimen is stained in this solution for one-half minute, washed, dried and examined, preferably with a high power. Another method is that of Giemsa. (27) The specimen must be fixt in either bichlorid or Schaudin's solution. It is then stained for one hour in a freshly prepared solution of 10 drops of Giemsa solution and 10 drops of one per cent of Aqueosus solution of sodium carbonate in 100 C. C. of distilled water. The Giemsa solution is staple and can either be bought or prepared in the laboratory. It is prepared by dissolving 3 grams of Azur II Eosin and .8 of a gram of Azur II in 350 C. C. of 60% methol alcohol. To this solution 250 C. C. of glycerine is added and the whole allowed to stand for 24 hours and then filtered.

For reference books we would recommend the following:

Practical Bacteriology, Microbiology and Serum Therapy—A. Besson. Publishers Longmans, Green and Co., New York. Translated by Hutchins $11.00

Pathogenic Micro organisms—MacNeal, Publishers P. Blakiston's Son and Co., Philadelphia, Pa.... 2.25

Pathogenic Bacteria and Protozoa —McFarland. Publishers W. B. Saunders and Co., Philadelphia, Pa. 3.50

General Bacteriology—Jordan. Publishers W. B. Saunders and Co., Philadelphia, Pa. 3.00

We would strongly urge those members of the dental profession, who have the facilities and interests in the most rapid furtherance of mouth infection studies, to secure a microscope, which need not be an expensive one, but equipped with a highpower dry objective and each a high and a low power eye piece, and some good reference books, and proceed to make observations and records, both for the great advantage of understanding and interpreting the conditions of their own patients as they present themselves and that they may contribute their collected findings to the sum total of data. It is only by collective and earnest study that the contradictions and evidence previously herein recited can be resolved into simple statements of facts, for truths do not conflict or contradict, tho partial truths and misread conditions do.

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2. Prowazek—reference—Arbeit aus dem kaiserlich Gesundheitz amte. 1904 Vol. XXI, p. 42.

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11. Skilled Bacteriologists Affirmative. See 14.

12. McFarland—Pathogenic Bacteria and Protozoa—p. 372.

13. Amesse—J. A. M. A., Vol. 63, No. 21, p. 1811.
Barret—Dental Cosmos 54, No. 8, p. 949.

14. Bass & Johns—N. O. M. & S. J., Vol. 67—No. 8, p. 13.
Smith, Middleton & Barrett, J. A. M. A., Vol. 63, No. 20, p. 1746.
Johns—J. A. M. A., Vol. 64—No. 7, p. 553.
Evans & Middleton—J. A. M. A., Vol. 64, No. 5, p. 422.
Bass & Johns—N. O. M. & S. J., Vol. 67, No. 5, p. 456.

15. Hartzell—This Journal. Howe, D. Cosmos, Vol. 57, No. 3, p. 307, J. A. D. S., Vol. 19, No. 14, p. 584.

16. Files of Commission.

17. Curet—N. O. M. & S. J., Vol. 67, No. 5, p. 464.

18. Wherry—J. Inf. Dis. 1912-10-162-165.
Rogers Brit. Med. J. 1912, 1424.

19. Evans & Middleton—J. A. M. A., Vol. 64. No. 5, p. 422.

20. Smith, Middleton & Barrett, J. A. M. A., Vol. 63, No. 20, p. 1746.

21. White—D. Cosmos, Vol. 57, No. 4, p. 405.

22. Noguchi, J.—Exp. Med., Vol. 16.

23. Jordan—"General Bacteriology," p. 158.

24. Besson—Practical Bacteriology, Micro-biology and Serum Therapy, 749.

25. Mac Neal—"Pathogenic Micro-organisms, p. 54.

26. Bass & Johns—J. A. M. A., Vol. 64, No. 7, p. 553.

27. Besson—"Practical Bacteriology," Microbiology and Serum Thearpy."—p. 727.

IMPORTANT NOTICE REGARDING TUNGSTEN AND MOLYBDENUM.

The Research Department is now receiving, regularly, tungsten and molybdenum of splendid quality and can furnish, immediately, or on short notice, these materials in almost any quantities for thoro testing and practical uses. Special diamond dies have been constructed for drawing the metal in the larger sizes in splendid quality. Application forms for the materials can be secured from the chairman.

As we are furnishing these materials at cost, we will ask you to kindly include postage and registration or insurance fee, as well as the amount for the metal.

RESEARCH FUND REPORT.

We, herewith, publish in detail the amounts of cash and subscriptions received to date from the various states and their chief cities. This report includes only the cash and pledges that have reached the Chairman by April 15, 1915. Several states have reported more than is shown in these figures but the signed subscriptions, or their equivalent, have not yet been received. In many communities only one payment is due, while in others two and three, which, in a large part, accounts for the difference in the ratio of payments to pledges. Several states are planning to take the work up at their spring and summer meeting.

The total cash and subscriptions to date, April 15, 1915, for which the pledges are in hand, are	$48,692.43
The total cash received to date (Including $1079.00, organization expense contributed by Chairman.)	12,312.50
The researches of last year cost, as per report in October issue	4,378.06
Organization expense to Jan. 1, 1914	1,079.00
The budget for this year is	8,000.00
Balance due to meet this year's budget	1,144.66

This money is being used for paying technicians, for laboratory expenses, etc. No money is paid to the various directors of researches. The seemingly imperative research work that we must push next year is so urgent that our budget must, if possible, be double what it is this year. This will be possible if some of the states that have not acted as yet do so promptly. Those who have made subscriptions will see the necessity of making their payments promptly as they come due.

The following is a detailed statement:

A financial statement of the Scientific Foundation and Research Commission's fund, giving the amounts by states, as well as some of the larger cities of each state.

State and Chief Cities.	Number of Subscribers.	Total Amount of Subscriptions, one-fifth payable annually for five years.	Amount Paid to date.
Alabama	0	0	0
Arizona	0	0	0
Arkansas	0	0	0
California	2	$75 00	$ 30
Los Angeles	2	75 00	30
Oakland	0	0	0
San Francisco	0	0	0
Colorado	65	$1910 00	$354 00
Colorado Springs	9	265 00	30 00
Denver	37	1190 00	268 00
Balance of State	19	455 00	56 00
Connecticut	1	$125 00	$ 50 00
Bridgeport	0	0	0
Hartford	0	0	0
New Haven	1	125 00	50 00
Waterbury	0	0	0
Delaware	0	0	0
District of Columbia			
Washington	20	$525 00	$178 00
Florida	1	$5 00	$1 00
Jacksonville	1	5 00	1 00
Tampa	0	0	0
Georgia	24	$346 00	$41 00
Atlanta	11	250 00	30 00
Macon	4	50 00	8 00
Savannah	0	00	00
Balance of State	9	46 00	3 00
Idaho	1	$5 00	$2 00
Illinois	70	$2430 00	$757 00
Chicago	61	2245 00	711 00
Peoria	0	00	00
Rockford	0	00	00
Springfield	0	00	00
Balance of State	9	185 00	46 00
Indiana	192	$3917 50	$405 50
Evansville	17	430 00	22 00
Fort Wayne	3	67 50	6 00
Indianapolis	41	1240 00	70 00
Balance of State	131	2180 00	307 50

State and Chief Cities.	Number of Subscribers.	Total Amount of Subscriptions, one-fifth payable annually for five years.	Amount Paid to date.
Iowa	127	$2587 50	$305 00
Cedar Rapids	2	35 00	10 00
Des Moines	23	520 00	46 00
Iowa City	7	145 00	35 00
Sioux City	0	00	00
Waterloo	18	220 00	26 00
Balance of State	77	1667 50	188 00
Kansas	44	$1190 00	$155 00
Kansas City	0	00	00
Topeka	7	185 00	15 00
Wichita	0	00	00
Balance of State	37	1005 00	140 00
Kentucky	51	$970 00	$263 00
Covington	6	130 00	66 00
Lexington	3	60 00	20 00
Louisville	29	620 00	124 00
Balance of State	13	160 00	53 00
Louisiana	26	$902 50	$179 50
New Orleans	14	675 00	135 00
Shreveport	5	125 00	25 00
Balance of State	7	102 50	19 50
Maine	0	00	00
Maryland	17	$1065 00	$497 00
Baltimore	16	965 00	397 00
Balance of State	1	100 00	100 00
Massachusetts	5	$375 00	$110 00
Boston	4	325 00	100 00
Somerville	1	50 00	10 00
Michigan	97	$4295 00	$906 00
Detroit	72	3720 00	778 00
Grand Rapids	1	25 00	00
Jackson	3	55 00	00
Kalamazoo	2	60 00	2 00
Saginaw	1	25 00	00
Balance of State	18	410 00	126 00
Minnesota	48	$1470 00	$132 00
Duluth	2	20 00	4 00
Minneapolis	18	800 00	87 00
St. Paul	13	260 00	13 00
Balance of State	15	390 00	28 00
Mississippi	2	$10 00	$2 00
Missouri	73	$1377 50	$268 50
Kansas City	15	430 00	76 00
St. Louis	31	655 00	154 00
St. Joseph	0	00	00
Springfield	4	90 00	7 00
Balance of State	23	202 50	31 50
Montana	0	00	00
Nebraska	23	$221 00	$58 00
Lincoln	2	15 00	9 00
Omaha	3	60 00	9 00
Balance of State	18	146 00	40 00
Nevada	0	00	00
New Hampshire	0	00	00

State and Chief Cities.	Number of Subscribers.	Total Amount of Subscriptions, one-fifth payable annually for five years.	Amount Paid to date.
New Jersey	4	$85 00	$6 60
Atlantic City	1	5 00	1 00
Newark	1	50 00	00
Camden	0	00	00
Trenton	0	00	00
Balance of State	2	30 00	5 00
New Mexico	1	$5 00	00
New York	227	$6732 50	$1900 00
Albany	1	25 00	5 00
Brooklyn	68	1355 00	230 00
Buffalo	41	874 50	234 00
New York City	64	2355 00	507 00
Rochester	11	360 00	66 00
Schenectady	0	00	00
Syracuse	5	115 00	23 00
Utica	0	00	00
Balance of State	37	1648 00	835 00
North Carolina	00	00	00
North Dakota	00	00	00
Ohio	348	11924 00	$4310 00
Akron	0	00	00
Canton	2	10 00	4 00
Cincinnati	89	2737 00	1092 00
Cleveland	91	5153 00	2225 00
Columbus	40	1240 00	429 00
Dayton	3	55 00	16 00
Toledo	37	1070 00	178 00
Youngstown	2	50 00	10 00
Balance of State	84	1609 00	356 00
Oklahoma	55	$577 50	$73 00
Oklahoma City	13	165 00	23 00
Balance of State	42	412 50	50 00
Oregon	0	00	00
Pennsylvania	70	$1107 50	$401 00
Allentown	2	30 00	12 00
Erie	2	35 00	7 00
Harrisburg	1	5 00	1 00
Philadelphia	13	350 00	121 00
Pittsburgh	4	70 00	18 00
Reading	5	62 50	25 00
Scranton	3	20 00	4 00
Wilkes Barre	11	175 00	35 00
Balance of State	29	360 00	178 00
Rhode Island	0	00	00
South Carolina	2	$40 00	00
Columbia	0	00	00
South Dakota	7	$75 00	$14 50
Sioux Falls	1	12 50	5 00
Balance of State	6	62 50	9 50
Tennessee	5	$160 00	$64 00
Chattanooga	1	10 00	4 00
Knoxville	1	50 00	20 00
Memphis	0	00	00
Nashville	3	100 00	40 00
Balance of State	0	00	00

State and Chief Cities.	Number of Subscribers.	Total Amount of Subscriptions, one-fifth payable annually for five years.	Amount Paid to date.
Texas	108	$1365 00	$181 50
Dallas	9	175 00	18 00
El Paso	10	50 00	20 00
Fort Worth	6	90 00	7 50
Galveston	1	25 00	5 00
Houston	5	45 00	12 00
San Antonio	4	100 00	20 00
Balance of State	73	850 00	99 00
Utah	0	00	00
Vermont	1	$100 00	$100 00
Virginia	2	$75 00	$15 00
Norfolk	0	00	00
Richmond	0	00	00
Washington	0	00	00
West Virginia	0	00	00
Wisconsin	82	$1105 00	$362 00
Madison	10	120 00	33 60
Milwaukee	28	370 00	165 00
Balance of State	44	615 00	164 00
Wyoming	2	$75 00	$15 00
Foreign	3	$100 00	$40 00

Contributions not included above:

Southern Branch of the National Dental Association	$ 36 00
Delta Sigma Delta Fraternity	100 00
National Dental Association (Surplus fund from Rochester meeting)	1227 93

The above report is being modified from day to day as subscriptions are being received and we shall be very glad for any suggestions or corrections.

Respectfully submitted:

WESTON A. PRICE, Chairman.

PROCEEDINGS OF THE HOUSE OF DELEGATES OF THE NATIONAL DENTAL ASSOCIATION.

TRUSTEES MEETING.

First Session of the Ad interim Committee, March 24, 1914, Chicago, Ill.

PURSUANT to the call of the President of the National Dental Association, the Ad interim Committee met at the LaSalle Hotel at 10:00 A. M. March 24, 1914, with the following present: Drs. Brown, Buckley and King. After a short conference it was decided to hold a session at 4:00 o'clock with the following committees:

All elective officers and trustees, local committee, section officers, members of clinic committee, members of educational council and chairman of the Scientific Research Commission.

VOTED to recess until 10 A. M. March 25.

JOINT MEETING OF THE AD INTERIM COMMITTEE AND THE VARIOUS OTHER OFFICERS AND COMMITTEES.

The Ad interim Committee of the National Dental Association and the various elective officers, local committee, section officers, members of the clinic committee, members of educational council and chairman of the Scientific Research Commission met in the International room at the LaSalle Hotel at 4:00 P. M. Dr. Homer C. Brown, President, called the meeting to order. The following were present:

Homer C. Brown, Columbus, Ohio.
M. L. Rhein, New York City, N. Y.
J. P. Buckley, Chicago, Illinois.
Otto U. King, Huntington, Indiana.
H. E. Friesell, Pittsburgh, Pa.
Carl D. Lucas, Indianapolis, Ind.
C. R. Lawrence, Enid, Oklahoma.
Benjamin Sandy, Minneapolis, Minn.
A. P. Burkhart, Auburn, New York.
J. V. Conzett, Dubuque, Iowa.
Weston A. Price, Cleveland, Ohio.
A. J. Bush, Columbus, Ohio.
Edward G. Link, Rochester, N. Y.
William W. Smith, Rochester, N. Y.
Benedict S. Hert, Rochester, N. Y.
Chas. L. Brininstool, Rochester, N. Y.
W. A. White, Phelps, New York.
LaFayette L. Barber, Toledo, Ohio.
W. A. Griffin, Detroit, Mich.

DR. BROWN, after calling the meeting to order, explained that the Ad interim committee had called into conference the officers and committeemen present to receive reports and suggestions relative to the 1914 session at Rochester and while this body had no official authority it could recommend and suggest to the Ad interim Committee, for its consideration, any proposition that it deemed advisable, and that the Ad interim Committee would appreciate and take under advisement these recommendations and suggestions.

DR. EDWARD G. LINK gave a verbal report explaining that the local commit-

tee thought it better to secure the Exposition Park Buildings at Rochester for the 1914 meeting. Dr. Link explained that the necessary hotel accommodations had been secured.

DR. CONZETT moved that it is the sense of those present that the local committee be given authority to secure the most available place in Rochester to hold all sessions of the 1914 meetings. This motion was seconded and carried.

The President presented a tentative program, which he had outlined and which provided for two sections meeting simultaneously.

DR. RHEIN moved that as a suggestion to the Ad interim Committee it be the sense of those present that two section meetings be held at the same time, in different halls. Motion was seconded and carried.

DR. A. P. BURKHART moved that it be the sense of those present that the recommendations for an evening session for the Research Commission be granted. Motion was seconded and carried.

DR. CONZETT, Chairman of the Clinic Committee, gave a verbal report of the work being done by his committee and suggested that the program be so outlined as to give Wednesday A. M. and Friday A. M. to clinics.

VOTED that the work of the Clinic Committee be left in the hands of the chairman of that committee.

VOTED that the admission to the National meetings, clinics and exhibitors be left and referred to the Ad interim Committee for a ruling.

There being no further business before this body, the motion to adjourn was carried.

Second Session Ad interim Committee.

The Ad interim Committee met at 10 A. M. March 25, 1914, at the LaSalle Hotel. The following were present: Drs. Brown, Buckley and King.

The first matter of business to come before this committee was the presentation of all the itemized bills which were as follows:

C. L. Ricketts	$ 348.30
New Franklin Ptg. Co.	165.25
	485.30
Tucker-Kenworthy Co., printing.	488.60
Herald & News-Express Co., printing	61.60
Wabash Cabinet Co., Cabinets..	113.22
R. G. Mitchell, Insurance	12.50
Whitelock Press, Printing	1820.96
Homer C. Brown	450.83
*Total Secretary's expense to March 30, 1914	1340.14

*In the secretary's labor account is a saving of $315.00 due to the fact that we employed our own operators to run the graphotype and emboss the 21,000 wide printing plates for the addressograph.

VOTED that all bills be allowed.

The Secretary raised the question as to the amount to be charged for the use of the addressograph machinery and the help in addressing the envelopes, etc. to outside concerns.

VOTED that the Secretary charge $2.00 for the first thousand envelopes addrest for a commercial company and $1.00 per thousand thereafter, but to the dental profession a charge of $1.00 for the first thousand and fifty cents per thousand thereafter.

VOTED that the Scientific Research Commission be requested to arrange a symposium of their work for the evening general session of July 7th.

The tentative program as outlined by Dr. Brown met the approval of the other members of the committee.

VOTED that the Secretary prepare a report of the meeting of the Ad interim Committee with the various officers and committees and also a report of the

meeting of the Ad interim Committee setting forth its action on the various bills, etc., and submit this to the absent members of the committee for their approval.

Meeting adjourned.

Third Session Ad interim Committee, Rochester, N. Y., April 18, 1914.

The following members of the Ad interim Committee met in Rochester, New York, April 18. Drs. Brown, Burkhart and King.

The minutes of the March meetings of the Ad interim Committee were read and approved.

*VOTED that the date for the state societies to pay their dues in advance of the 1914 National meeting be extended to July 10th.

VOTED that Dr. Brown send a special telegram of greeting from the National to the various state societies upon the day of their state society meeting.

VOTED that the secretary of the National Dental Association open his office on Monday, July 6, in the Powers Hotel at Rochester, N. Y., in order that the House of Delegates and other members may be able to secure their credentials, buttons, etc., thus avoiding confusion and misunderstanding that might exist if the secretary's office was not opened up until the morning of the meeting.

There being no further business this meeting adjourned.

*(The committee found that some states would not be able to hold their annual meeting until after the time limit as specified in the constitution and by-laws of the National Dental Association for the payment of National dues and,therefore, it would be impossible for such states to pay dues this year and receive recognition in the House of Delegates. To accommodate these states the above motion was placed on record.)

Minutes of Meeting of Board of Trustees of National Dental Association Held at Exposition Park, Rochester, N. Y., July 7-10, 1914.

FIRST SESSION.

Exposition Park, July 7, 2:30 P. M.

Meeting called to order by Dr. Brown.

The following members were present: Drs. Brown, King, Hinman, Burkhart, Hartzell, Platt, Buckley, Warner, Grieves, Melendy and White.

Minutes of Ad interim Committee meeting of March 24, 25 and April 18 were read and approved.

DR. BURKHART suggested that an hour be set to take up the work of the Board of Trustees.

VOTED that upon adjournment the Board meet at the Powers Hotel at 5:00 P. M., July 7th.

VOTED to adjourn to Powers Hotel at 5:00 o'clock.

SECOND SESSION.

Powers Hotel, July 7, 1914, 5:00 P. M.

Meeting called to order by Dr. Brown at 5:00 P. M.

ROLL CALL: Drs. Brown, King, Hinman, Burkhart, Hartzell, Platt, Buckley, Warner, Grieves, Mellendy and White were present.

SECRETARY'S report read and discust.

DR. KING recommended that the next secretary be provided with an advance expense account.

THE SECRETARY presented all bills, itemized, which had been allowed by Ad interim Committee, and also unpaid bills as follows:

ITEMIZED STATEMENT OF DISBURSEMENTS AS TO EXPENDITURE ORDERS NOS. 1 TO 48, INCLUSIVE.

Jan. 7	*THE MATHEWS & NORTHRUP WORKS, balance on printing account		$ 25.00
Jan. 28	ADDRESSOGRAPH COMPANY, Graphotype and Addressograph machines, filing cabinets, frames, plates and complete equipment		1208.36
Jan. 29	FIDELITY & DEPOSIT COMPANY, premium on Treasurer's Bond of $5,000		20.00
Mch. 11	*OTTO U. KING, GENERAL SECRETARY, stenographer's services for eight months		400.00
Mch. 11	*WMS. DONNALLY, Legislative Committee		150.00
Mch. 11	GEORGE E. COLE & COMPANY, secretary's ledger and cash book, 5 state membership record boods, 1 treasurer's cash book and ledger		44.00
May 1	WHITELOCK PRESS, publishing two issues of the Bulletin, stationery, printing, etc.		1820.96
May 1	WABASH CABINET COMPANY, letter and membership card files		113.22
May 1	R. G. MITCHELL, insurance, premium on Addressograph machinery, files, fixtures, etc.		12.50
May 1	HERALD & NEWS-EXPRESS COMPANY, printing		61.60
May 1	OTTO U. KING, general secretary's account—stamps, postage, on Bulletin, etc.	$ 463.18	
	Freight	19.44	
	United States Express	13.74	
	Wells Fargo Express	14.82	
	Miscellaneous, drayage, telephones, telegraph, office supplies, etc.	174.91	
	Labor	636.05	
	Justin Lovett, office supplies (itemized bills filed with receipts)	8.00	
			$1340.14
May 4	C. L. RICKETTS, 10,000 certificates of membership, 10,000 mailing tubes, 12 post binders		348.30
May 4	NEW FRANKLIN PRINTING COMPANY, printing Constitution and By-Laws		165.25
May 4	TUCKER-KENWORTHY COMPANY, State and National membership cards		488.60
May 4	HOMER C. BROWN, official expenses		450.83
May 27	TUCKER-KENWORTHY COMPANY, additional membership cards		6.25
May 27	ADDRESSOGRAPH COMPANY, additional supplies for machines		67.71
June 11	*OTTO U. KING, GENERAL SECRETARY, stenographer's services for three months		150.00
July 7	*OTTO U. KING, GENERAL SECRETARY, stenographer's services for one month		50.00
July 10	OTTO U. KING, general secretary's office account—miscellaneous, express, electricity, supplies, freight, etc.	$ 144.96	
	Stamps	387.27	
	Labor, rent, etc.	438.20	
	March 9, 1914, stenographer's desk	25.35	
	Expense for stenographer, telegram, express, etc., at Rochester	63.92	
			1059.70

July 10—J. V. CONZETT, chairman clinic committee		177.31
July 10—HOMER C. BROWN, president's office expenses		303.28
July 10—OTTO U. KING, general secretary's salary		1200.00
July 10—C. R. LAWRENCE, president of state society officers' Section		3.20
July 10—WHITELOCK PRESS, printing of one issue of Bulletin, 1914 program, etc.		1681.75
July 10—BURTON LEE THORPE, secretary of F. D. I. committee		53.04
July 10—H. B. McFADDEN, treasurer's expense account		24.73
July 10—H. B. McFADDEN, treasurer's salary		200.00
July 10—The S. S. WHITE DENTAL MFG. COMPANY, printing and mailing 1913 transactions		462.43
July 10—HOMER C. BROWN, cablegrams and telegrams at Rochester		50.20
July 10—JOSEPH C. BLOODGOOD, guest of the association		29.25
July 10—EDGAR M. CARSON, stenographer, stamps, etc., clinic committee		7.00
July 10—GERALD G. BURNS, postage, express, stenographers, printers, clinic committee		30.53
July 10—CENTRAL LAW REPORTING COMPANY, reporters of 1914 meeting		250.00
July 10—WILLIAM CRENSHAW, chairman of legislative committee, typewriting, telegrams, postage, etc.		304.10
July 10—VICTOR C. VAUGHAN, express and traveling, guest of association		25.00
July 10—CARL D. LUCAS, stamps, telegrams, stenographer, Section II		13.57
July 10—ARTHUR D. BLACK, stamps, express and telephone		10.00
July 10—FIDELITY & DEPOSIT COMPANY, premium on treasurer's bond of $10,000		40.00
Sept. 2—OTTO U. KING, general secretary's salary for two months, and stenographer		320.00
Nov. 2—OTTO U. KING, general secretary's and stenographer's salary for two months		320.00
Nov. 3—OTTO U. KING, general secretary's expense account, stamps and postage on Bulletin	$ 228.28	
Express, telephone, telegraph and drayage	28.94	
Electricity, labor, rent and supplies	467.48	
Miscellaneous	72.98	
Statement of miscellaneous, since record was made up	31.94	
		829.62
Nov. 3—CLINTON G. FISH, designer of Bulletin cover		58.00
Dec. 1—OTTO U. KING, general secretary's and stenographer's salary		160.00
Dec. 24—R. L. POLK & COMPANY, directory		5.00
Dec. 31—OTTO U. KING, general secretary's and stenographer's salary		160.00
Dec. 31—OTTO U. KING, general secretary's expense account—express, telephone, telegraph and freight	$ 20.47	
Stamps and postage	133.48	
Labor, rent, electricity and supplies	253.67	
Car fare, hotel expenses, and miscellaneous	41.61	
		449.23
Dec. 31—HENRY L. BANZHAF, secretary-treasurer of The Dental Educational Council of America		200.00
Total		$15,349.66

*Authorized by Board of Trustees at Kansas City in 1913.

VOTED that when the Secretary's account is approved, that 3% be added to reimburse him for advancing the large sum of money which he advanced.

VOTED that this Board approve the reports of the Ad interim Committee and appoint a committee of two to go over all bills with the Secretary. Drs. Melendy and White were appointed to serve on this auditing committee.

VOTED that upon adjournment this Board meet at Exposition Park at 12 o'clock noon, July 8th.

VOTED that it will meet with the approval of this Board for Dr. Platt to present his pictures, etc., in reference to Panama Pacific Exposition, on Thursday night following the scheduled program.

MEETING ADJOURNED to 12:00 o'clock July 8th.

THIRD SESSION.

EXPOSITION PARK, July 8, 12:00 noon.

Meeting called to order by Dr. Brown at 12:15 noon.

Minutes of two previous meetings read and approved.

VOTED that the Board of Trustees recommend that whatever balance is turned over by the local committee be transferred to the Research Commission Fund.

AUDIT COMMITTEE, thru Dr. Melendy, reported that the Secretary's books were well and systematically kept and that the vouchers were covered by receipted bills, but that there is an immense mass of receipts which will take two or three days to audit. This committee recommended that when convenient to close the books of the Secretary they be audited by an audit company or certified auditor.

VOTED that the Secretary be directed to employ an auditor to audit his books to August 1, 1914, payment of the auditor to be made by an order drawn on the Treasurer. (Books balanced and audited on January 1, 1915. See report on page 71, Volume 2, No. 1, of The Journal.)

VOTED that the Secretary be authorized to submit his monthly expense account to the Ad interim Committee and when approved the Secretary and President shall draw an order on the Treasurer to cover same.

VOTED that nothing be published in the minutes except the actual business transpiring and the motions past in proper form and that no remarks with reference to the motions be included in the minutes for publication.

VOTED to adjourn to meet at Powers Hotel tomorrow morning, July 9th, at 9:00 o'clock.

ADJOURNED 1:15 P. M.

FOURTH SESSION.

Powers Hotel, July 9th, 7:30 P. M.

Meeting called to order by Dr. Brown.

ROLL CALL: Drs. Hinman, Brown, Hartzell, Burkhart, Melendy, Buckley, Warner, Platt and King were present.

The following were nominated as members of the Scientific Foundation and Research Commission: Dr. Homer C. Brown, to fill the unexpired term of the late Dr. M. H. Fletcher, and Drs. George E. Hunt, Indianapolis, Ind., Samuel H. McAfee, New Orleans, La., M. Williams, Rutland, Vt., G. T. Williams, Seattle, Wash., and W. T. Farrar, Louisville, Ky., to serve five years.

The Secretary was instructed to read these names to the House of Delegates for their confirmation. (See the Journal, Vol. II, No. 1, page 69).

VOTED that the Educational Council be allowed $200.00 for work accomplished and to cover work for the coming year.

VOTED that the present representation of the National Dental Association on the Dental Educational Council of America be continued at follows: Drs. J. V. Conzett, Chairman, 256 Thirteenth St., Dubuque, Ia.; Louis Meisburger, 85 North Pearl Street, Buffalo, N. Y., Arthur R. Melendy, Holston National Bank Building, Knoxville, Tenn.; LaFayette L. Barber, 718 Spitzer Bldg., Toledo, Ohio; George N. West, 32 North State St., Chicago, Ill.

VOTED that all bills presented and read be allowed.

VOTED that an order of $150.00 be allowed to the official reporters now and the balance of $100 at the time all manuscripts and completed reports are received by the Secretary.

DR. HERBERT L. WHEELER, Chairman of the Journal Committee, submitted his report. (See report in The Journal, Vol. II, No. 1, page 67).

VOTED that the Journal Committee's report be adopted as a whole.

MOVED to adjourn until July 9th at 3. P. M.

FIFTH SESSION.

Exposition Park, July 9, 3:00 P. M.

Meeting called to order by Dr. Brown. All members of the Board were present.

VOTED that the salary of the Treasurer for next year be fixed by this Board at $100.00 per annum.

VOTED that the Treasurer be directed to invest the uninvested funds of the National Relief Fund or place same on deposit as Treasurer of the National Association in a Trust Company or Savings Bank to be approved by the President and Secretary-elect.

VOTED that the Secretary be allowed $15.00 a week or $780.00 a year for a stenographer's services, payments to be made monthly.

VOTED that the salary of the Secretary be fixed at $1200.00 per annum for last year and the same amount for the ensuing year, payments for the ensuing year to be made monthly.

Nominations for Treasurer.

VOTED that Drs. H. B. McFadden and J. V. Conzett be nominated by this Board as candidates for Treasurer.

VOTED to adjourn to meet at 7 P. M. at Powers Hotel.

ADJOURNED.

SIXTH SESSION.

Powers Hotel, July 9, 8:15 P. M.

Meeting called to order by Dr. Brown.

Dr. Brown reported as to his knowledge with regard to employment of attorney by Legislative Committee.

VOTED that no moneys be expended or obligations incurred by the various committees outside of their expenses, such as postage, printing, etc., without the consent of the Board of Trustees and that the Secretary be directed to send a notice of this resolution to the chairman of each committee.

The members of the various Standing Committees and The Journal Committee, were nominated and the General Secretary was instructed to report same to the House of Delegates. (See Volume 2, No. 1, pages 68-69 of The Journal.)

Communication read from Merchants' Association of New York in relation to 1919 International Congress, and it was

VOTED that it be recommended to the House of Delegates that the Seventh International Dental Congress be invited to hold their next convention in New York City.

VOTED that the Treasurer be directed to furnish a bond in the sum of $10,000.00, expense of same to be paid by the National Dental Association.

VOTED to adjourn until 10:45 A. M., tomorrow at Exposition Park.

SEVENTH SESSION.

Exposition Park, July 10, 10:45 A. M.

Meeting called to order by Dr. Brown.

VOTED that expense of cablegrams and telegrams sent to London, Eng., and Washington, D. C., by President Brown be ordered paid.

VOTED that the Legislative Committee's bill of $304.10 be ordered paid and the order sent to the Chairman of the Committee.

VOTED that Carl D. Lucas, chairman of section 2, expense account of $13.57 be allowed.

VOTED that S. S. White bill for publishing the proceedings, amounting to $462.43, be ordered paid.

VOTED that the proceedings of this convention be published in the Bulletin under the direction of the Ad interim Committee and the Journal Committee.

VOTED that the Ad interim Committee consist of the President-elect and Secretary-elect, Drs. Buckley, Burkhart and Ward.

VOTED that the appointment of the Committee on Oral and Dental Hygiene, as a standing committee be referred to the Ad interim Committee for appointment.

VOTED that the Ad interim Committee be directed to print the Constitution and By-Laws in amended form as adopted at this convention.

VOTED to adjourn.

First Session of the New Ad interim Committee.

Powers Hotel,

Rochester, N. Y., July 10, 2 P. M.

DR. DON M. GALLIE of Chicago, the new President, called the meeting to order and announced that we were ready to transact business.

Members present were Drs. Don. M. Gallie, J. P. Buckley, H. J. Burkhart and Otto U. King.

VOTED that an order be drawn on the treasury for $7.00 for bill filed by Edgar M. Carson, member of the Clinic Committee.

The bill of $30.53 for Dr. Gerald G. Burns, member of the Clinic Committee, was read and upon motion made, seconded and carried this bill was authorized to be paid.

DR. HOMER C. BROWN, Chairman of the Legislative Committee, appeared before the Committee and after due consideration, the following motion was past.

VOTED that the Legislative Committee be instructed to carry out the legislation approved by the House of Delegates and that the sum of one hundred dollars ($100) be appropriated to this committee.

VOTED that the Lincoln National Bank of Rochester be the depository for funds of the National Relief Fund.

VOTED that all relief funds of the National Dental Association now or hereafter deposited with the Lincoln National Bank of Rochester, Rochester, New York, be subject to the check of the Association, signed Relief Fund, National Dental Association, by its treasurer.

VOTED that the bond of the treasurer be approved by the President and Secretary.

The following were appointed on the Oral and Dental Hygiene Committee: Drs. W. H. G. Logan, Chicago, Chairman; J. D. Patterson of Kansas City, Mo., Stanley L. Rich of Nashville, Tenn.; H. F. Hoffman, Denver; Col. and W. D. Tracy of New York City.

There being no further business the meeting adjourned.

A LIST OF THE 300 SIMPLIFIED SPELLING WORDS USED IN THE JOURNAL.

abridgment	abridgement
accouter	accoutre
accurst	accursed
acknowledgment	acknowledgement
addrest	addressed
adz	adze
affixt	affixed
altho	although
anapest	anapaest, anapæst
anemia	anaemia, anæmia
anesthesia	anaesthesia, anæsthesia
anesthetic	anaesthetic, anæsthetic
antipyrin	antipyrine
antitoxin	antitoxine
apothem	apothegm, apophthegm
apprize	apprise
arbor	arbour
archeology	archaeology, archæology
ardor	ardour
armor	armour
artizan	artisan
assize	assise
ax	axe
bans	banns
bark	barque
behavior	behaviour
blest	blessed
blusht	blushed
brazen	brasen
brazier	brasier
bun	bunn
bur	burr
caliber	calibre
caliper	calliper
candor	candour
carest	caressed
catalog	catalogue
catechize	catechise
center	centre
chapt	chapped
check	cheque
checker	chequer
chimera	chimaera, chimæra
civilize	civilise
clamor	clamour
clangor	clangour
clapt	clapped
claspt	clasped
clipt	clipped
clue	clew
coeval	coaeval, coæval
color	colour
colter	coulter
commixt	commixed
comprest	compressed
comprize	comprise
confest	confessed
controller	comptroller
coquet	coquette
criticize	criticise
cropt	cropped
crost	crossed
crusht	crushed
cue	queue
curst	cursed
cutlas	cutlass
cyclopedia	cyclopaedia, cyclopædia
dactyl	dactyle
dasht	dashed
decalog	decalogue
defense	defence
demagog	demagogue
demeanor	demeanour
deposit	deposite
deprest	depressed
develop	develope
dieresis	diaeresis, diæresis
dike	dyke
dipt	dipped
discust	discussed
dispatch	despatch
distil	distill
distrest	distressed
dolor	dolour
domicil	domicile
draft	draught
dram	drachm
drest	dressed
dript	dripped
droopt	drooped

dropt	dropped
dulness	dullness
ecumenical	oecumenical, œcu-
edile	aedile, ædile
egis	aegis, ægis
enamor	enamour
encyclopedia	encyclopaedia, -pædia
endeavor	endeavour
envelop	envelope
Eolian	Aeolian, Æolian
eon	aeon, æon
epaulet	epaulette
eponym	eponyme
era	aera, æra
esophagus	oesophagus, œsophagus
esthetic	aesthetic, æsthetic
esthetics	aesthetics, æsthetics
estivate	aestivate, æstivate
ether	aether, æther
etiology	aetiology, ætiology
exercize	exorcise
exprest	expressed
fagot	faggot
fantasm	phantasm
fantasy	phantasy
fantom	phantom
favor	favour
favorite	favourite
fervor	fervour
fiber	fibre
fixt	fixed
flavor	flavour
fulfil	fulfill
fulness	fullness
gage	gauge
gazel	gazelle
gelatin	gelatine
gild	guild
gipsy	gypsy
gloze	glose
glycerin	glycerine
good-by	good-bye
gram	gramme
gript	gripped
harbor	harbour
harken	hearken
heapt	heaped
hematin	haematin, hæmatin
hiccup	hiccough
hock	hough
homeopathy	homoeopathy, homœop-
homonym	homonyme
honor	honour
humor	humour
husht	hushed
hypotenuse	hypothenuse
idolize	idolise
imprest	impressed
instil	instill
jail	gaol
judgment	judgement
kist	kissed
labor	labour
lacrimal	lachrymal
lapt	lapped
lasht	lashed
leapt	leaped
legalize	legalise
license	licence
licorice	liquorice
liter	litre
lodgment	lodgement
lookt	looked
lopt	lopped
luster	lustre
mama	mamma
maneuver	manœuver, manœuvre
materialize	materialise
meager	meagre
medieval	mediaeval, mediæval
meter	metre
mist	missed
miter	mitre
mixt	mixed
mold	mould
molder	moulder
molding	moulding
moldy	mouldy
molt	moult
mullen	mullein
naturalize	naturalise
neighbor	neighbour
niter	nitre
nipt	nipped
ocher	ochre
odor	odour
offense	offence
omelet	omelette
opprest	oppressed
orthopedic	orthopaedic, orthopædic
paleography	palaeography, palæog-
paleolithic	palaeolithic, palæolithic
paleontology	palaeontology, palæon-
paleozoic	palaeozoic, palæozoic
paraffin	paraffine
parlor	parlour
partizan	partisan
past	passed
patronize	patronise
pedagog	pedagogue, pædagogue

pedobaptist	paedobaptist, paedo-
phenix	phoenix, phœnix
phenomenon	phaenomenon, phænom-
pigmy	pygmy
plow	plough
polyp	polype
possest	possessed
practise, v. and n.	practice
prefixt	prefixed
prenomen	praenomen, prænomen
prest	pressed
pretense	pretence
preterit	preterite, præterite
pretermit	praetermit, prætermit
primeval	primaeval, primæval
profest	professed
program	programme
prolog	prologue
propt	propped
pur	purr
quartet	quartette
questor	quaestor, quæstor
quintet	quintette
rancor	rancour
rapt	rapped
raze	rase
recognize	recognise
reconnoiter	reconnoitre
rigor	rigour
rime	rhyme
ript	ripped
rumor	rumour
saber	sabre
saltpeter	saltpetre
savior	saviour
savor	savour
scepter	sceptre
septet	septette
sepulcher	sepulchre
sextet	sextette
silvan	sylvan
simitar	scimitar, cimeter, etc.
sipt	sipped
sithe	scythe
skilful	skillful
skipt	skipped
slipt	slipped
smolder	smoulder
snapt	snapped
somber	sombre
specter	spectre
splendor	splendour
stedfast	steadfast
stept	stepped
stopt	stopped
strest	stressed
stript	stripped
subpena	subpoena, subpœna
succor	succour
suffixt	suffixed
sulfate	sulphate
sulfur	sulphur
sumac	sumach
supprest	suppressed
surprize	surprise
synonym	synonyme
tabor	tabour
tapt	tapped
teazel	teasel, teasle, teazle
tenor	tenour
theater	theatre
tho	though, tho'
thoro	thorough, thoro'
thorofare	thoroughfare
thoroly	thoroughly
thru	through, thro', thro
thruout	throughout
tipt	tipped
topt	topped
tost	tossed
transgrest	transgressed
trapt	trapped
tript	tripped
tumor	tumour
valor	valour
vapor	vapour
vext	vexed
vigor	vigour
vizor	visor
wagon	waggon
washt	washed
whipt	whipped
whisky	whiskey
wilful	willful
winkt	winked
wisht	wished
wo	woe
woful	woeful
woolen	woollen
wrapt	wrapped

ANNUAL MEETING OF THE MEMBERS OF THE DENTAL PROTECTIVE ASSOCIATION.

The regular annual meeting of the members of the Dental Protective Association of the United States was held at the LaSalle Hotel in the city of Chicago on Monday afternoon, December 21st, 1914. Due notice in writing was given to each member of the Association of this meeting in compliance with the requirements of the by-laws and notification was also published in the daily press. The president, Dr. J. G. Reid, presided. An unusually large number of members was present but in order to give to those who were unable to attend some idea of the present status of the Association those at the meeting proposed that a brief synopsis of the secretary's and treasurer's report be published in one or more publications of general circulation among dentists.

The secretary, Dr. J. P. Buckley, presented a detailed report of the activities of the officers and directors during the year, described the organization of the board, the election of the officers and the taking over of the books and records of the Association from the administrative officers of the preceding years. He commented particularly upon the thoro, accurate and business-like manner in which the former president, Dr. J. N. Crouse, had kept the books and records of the Association and carried on the voluminous correspondence entailed by the agreement entered into with Dr. W. H. Taggart on behalf of the Association.

The Association has now about eight thousand (8,000) members upon its books, nearly five thousand (5,000) of whom paid the special assessment in 1900 while over forty-two hundred (4200) availed themselves during 1910 to 1912 of the agreement entered into with Dr. Taggart and paid the requisite fifteen dollars ($15).

The officers of the Association increased the annual revenue by changing the investments during the year in purchasing twenty-one thousand dollars ($21,000) of municipal bonds of the highest grade at exceptionally low prices, as the bonds were purchased at the time when the market was at the lowest ebb, due to the foreign war. About five thousand dollars ($5,000) in cash remains on deposit at a low rate of interest in substantial savings banks in the city in charge of Dr. D. M. Gallie, treasurer, who has given a Surety Company's bond to the Association in the sum of five thousand dollars ($5,000). The directors during the year amended the by-laws so as to require that the secureties and other valuable papers of the Association be deposited in a box rented in the name of the Association in one of the large safety deposit company's vaults with the requirement that the box may be opened only in the presence of two members of the Board.

Certain doubtful assets which have remained stagnant for many years were converted and are being liquidated in a satisfactory manner so that the finances of the Association are in excellent condition.

The secretary further called attention to the statement which he caused to be published in the Bulletin of the National Dental Association in the October issue emphasizing the fact that the Dental Protective Association of the United States was still in active business, had

more than twenty-five thousand dollars ($25,000) in the treasury and was prepared at all times to carry out the purpose of its organization. To this published statement of October last the secretary now directs the attention of all members who are still in doubt as to their status under the Taggart agreement.

From the treasurer's report for the year ending December 10th, 1914, the following facts may be mentioned:

The treasurer received as a cash balance on hand at the beginning of the year twenty-five thousand, six hundred twenty-eight dollars and thirty-five cents ($25,628,35). The receipts during the year from all sources amounted to two thousand thirty-six dollars and seventy-eight cents ($2036.78). The disbursements during the year were two hundred forty-seven dollars and five cents ($247.05) exclusive of the purchase of twenty-one thousand dollars ($21,000) of bonds, which amounted to a change merely in the form of the assets. The total assets of the Association on December 19, 1914, amounted to thirty-five thousand, two hundred eighty-seven dollars and fifty-eight cents ($35,287.58), of which twenty-seven thousand two hundred eighty-seven dollars and fifty-eight cents ($27,287.58) was in municipal bonds and cash and eight thousand dollars ($8,000) in individual notes secured by a corporation note for three times the amount.

The present Board of Directors were re-elected for the ensuing year.

Signed: J. G. REID,
J. P. BUCKLEY,
D. M. GALLIE,
Board of Directors.

MEMORIAL RESOLUTIONS.

Dr. John N. Crouse.

At the annual meeting of the Dental Protective Association, held in December 1914, being the first meeting subsequent to the death of Dr. Crouse, a committee was appointed to prepare for publication a statement which might serve to show the appreciation of the members of the Association for the character and great services to the dental profession of Dr. J. N. Crouse, who organized the Association and was its President and executive head till shortly before his death.

Dr. Crouse displayed great ability and tremendous force of character, and enthusiasm and perseverence which finally overcame the general indifference, and much active opposition of the dental profession, and won a sufficiently numerous membership in the Protective Association to provide enough funds to resist successfully the claims of the Crown and Bridge Company. The defense was so complete that the Crown and Bridge Company never collected anything of consequence from the dental profession. If the dentists had been obliged, for a year or two at first, to pay the licenses demanded by the Crown Company as they had previously done for many years to the Goodyear Dental Vulcanite Company the great services rendered by Dr. Crouse thru the Dental Protective Association would have been universally acknowledged. As it was, appreciation for his services was less in evidence than a persistent and essentially unfair complaint and criticism of Dr. Crouse personally, and of his management of the affairs of the Protective Association.

It did not seem to be understood that a plan of organization similar to that of our dental societies is not well adapted

to fight a legal battle. It was indispensable, as in war, that one man should be in supreme command, able to choose his own helpers and subordinates, and to command the entire resources of the Association for instant action whenever necessary. So far as appears, there was no other man in the dental profession who had the ability, and the willingness to make the personal sacrifices necessary to accomplish what he did. The value of his services to the profession can never be known, that it amounted to millions of dollars there is no room to doubt.

Dr. Crouse always took an active interest in the welfare and progress of his profession and for many years he was a familiar figure to all who attended dental society meetings anywhere. He was one of the charter members of the Illinois State Dental Society, and for some time before his death he was the only surviving charter member who had maintained his membership continuously. He was active in the administrative affairs of the three principal societies to which he belonged—the Chicago Dental Society, the Illinois State Dental Society, and the American Dental Association. He was president of each of them.

The last important service to the Dental Protective Association was the arrangement with Dr. Taggart by which the members of the Association received licenses under his patents for a trifling sum. In this he had the active assistance of the other directors, Dr. C. N. Johnson and Dr. J. P. Buckley, and without all three of them the plan would probably have failed.

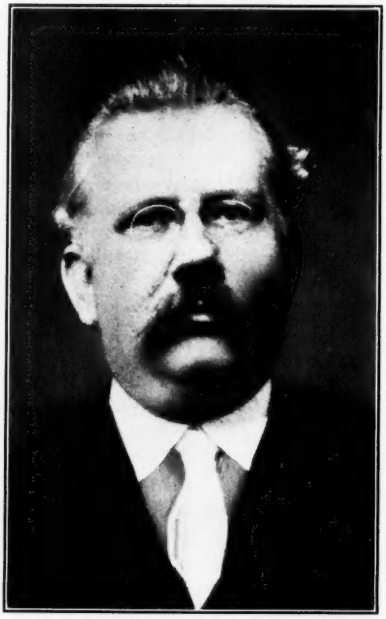
Dr. Crouse did not receive in his lifetime the honor and appreciation from his profession that his great services deserved, and which will undoubtedly be accorded to him in the future. He will have a place among the great benefactors of the dental profession.

EDMUND NOYES, Chairman,
J. E. HINKINS,
C. E. BENTLEY.

DR. H. B. McFADDEN.

"Died, from pneumonia, February 14, 1915, at Philadelphia, Henry Birkinbine McFadden, D. D. S.

He was born in Germantown, Philadelphia, October 30, 1861. He was graduated in dentistry with the class of 1882 of the dental school of the University of Pennsylvania. For ten years Dr. McFadden was demonstrator of mechanical dentistry in the dental school of the University of Pennsylvania. He held membership in the National Dental Association, of which he was treasurer from 1911 until the time of his death; he was also a member of the Pennsylvania State Dental Society and its second vice-president, a member of the Academy of Stomatology of Philadelphia, the Odontographic Society of West Philadelphia, the First District Dental Society of the State of New York, and the Dental Alumni Society of the University of Pennsylvania. He was a member of the University of Pennsylvania Club of New York City, and various other social, Masonic, and professional organizations."



DR. H. B. McFADDEN.

THE JOURNAL
of the
NATIONAL DENTAL
ASSOCIATION

Entered as second class matter, November 22, 1913, at the Post Office at Huntington, Indiana, under the Act of August 24, 1912. Published Quarterly.

All contributions and correspondence should be addrest to the General Secretary,
OTTO U. KING, D D. S.,
Huntington, Indiana.

Subscription to The Journal of the National Dental Association included in the annual dues.
Subscription Price, for 1915, to non-members, living in all parts of United States, Hawaiian Islands, the Philippines, Guam, Porto Rico, Cuba, Canal Zone and Mexico, $1.00. Canada, $1.10. To other foreign countries, $1.40.
The editor and publishers are not responsible for the views of authors exprest in these pages.

VOL. 2 MAY, 1915 NO. 2

EDITORIAL

DENTAL ROENTGENOGRAMS AND THE DIAGNOSIS OF MOUTH LESIONS.

In his new book on Special Dental Pathology, Dr. G. V. Black states that the present opportunity before the dental profession "to take an important part in the preservation of the general health is almost without parallel in medical advancement." The researches of Hunter of London, of Billings of Chicago, and many other prominent men of the medical profession have led them to say that the mouth presents a greater number of chronic foci than any other part of the body, which means that a majority of those grave diseases which occur secondary to such foci may be prevented, or in many cases cured, by the elimination of the mouth suppurations. Herein lies the opportunity of which Dr. Black speaks.

To take advantage of this opportunity the dentist must be prepared to make an examination which will lead to a proper diagnosis. While it so happens that practically all chronic suppurations involving the dental tissues destroy more or less bone, it does not follow that radiographs alone are sufficient to a diagnosis. As a

rule, a thoro clinical examination should be made first, this should be supplemented by radiographs, and in many cases a second examination should be made with the radiographs before the operator.

Ability to make a proper diagnosis must be based on a good knowledge of the anatomical relations of the various tissues, and the pathological changes by which they may be involved. To this must be added experience in observation, in the technique of mouth examinations, and in the interpretation of radiographs. When a correct diagnosis has been reached, the possibilities of repair must be known if rational treatment is to be employed.

The members of the dental profession are being called upon to decide these questions. The future health of many people and the reputation of the dental profession are at stake. Teeth which are a menace to health should be properly treated or extracted; teeth which are not should be saved. Extraction should not be employed to cover ignorance.

An imperfect root canal filling is not necessarily a menace to health; a perfect root canal filling is not a guarantee of safety. An apparently good root filling, as shown by a radiograph, may be a very imperfect root filling—it may reach to the end of the root without **filling** the canal.

The radiograph is the most important aid in the diagnosis of chronic mouth foci which has come to the dental profession in many years. However, the development of skill in the exploration of sinuses, and of pockets about the teeth, the acquirement of the finest sense of touch, and of keen observation, all stimulated by the habit of carefully recording the findings in each case, will serve to place the radiograph where it belongs, as a **very important aid** in diagnosis.

SIMPLIFIED SPELLING USED IN THE JOURNAL.

The Journal has adopted the system of spelling recommended by the "Simplified Spelling Board", and on page 177 will be found a list of these words, which we publish for the guidance and use in preparation of all copy for publication in The Journal. Of the 300 words in this list, 153 had been recommended and used in the Government Printing Office for some time previous to September 4, 1906, when this list was adopted.

"It will be seen that of the three hundred simple forms included in the list, more than one-half are preferred by Webster's Dictionary, more than six-tenths are preferred by the Century, and two-thirds are preferred by the Standard: while nearly all the rest, except some of the inflected forms (which are often ignored), are allowed by all three dictionaries as alternative spellings, in many cases held equal in authority or superior in etymological accuracy to the form nominally preferred. The result is, in short, that nearly the whole list has the sanction of all the dictionaries current in the United States, either as preferred or alternative spellings."

ANNOUNCEMENTS.

INTERNATIONAL.

International Dental Federation, San Francisco, Cal., August 30, 1915.

NATIONAL SOCIETIES.

Panama-Pacific Dental Congress, San Francisco, Cal., August 30-Sept. 9, 1915.

National Dental Association—House of Delegates, Sept. 1-2, 1915, San Francisco, Cal.

American Society of Orthodontists, Aug. 30, 1915, San Francisco, Cal.

American School Hygiene Association, June 25-26, San Francisco, Cal.

American Institute of Dental Teachers, Jan. 25-27, 1916, Minneapolis, Minn.

STATE SOCIETIES.

June.

Colorado—Manitou, June 17-18-19.

Florida—June 9-10-11.

Georgia—Atlanta, June 17-18-19.

Idaho—Salmon, June.

Kentucky—Ashland, June 8-10.

Louisiana—New Orleans, June 3-5.

Missouri—Jefferson City, June 10-12.

New Hampshire—Weirs, June 22-24.

North Carolina—Wrightsville Beach, June 23-25.

Pennsylvania—Reading, June 22-24.

Tennessee—Sewanee, June 24-25-26.

Utah—Salt Lake City, June 21-22.

July.

Montana—Helena, July 15-17.

New Jersey—Asbury Park, July 21-24.

Wisconsin—Oconomowoc, July 13-15.

September.

National Capitol—Washington, Sept. 7.

October.

New Mexico—Albuquerque, Oct. 4-11.

November.

Arizona—Phoenix, November 11-13.

Virginia—Richmond, November 4.

December.

Maryland—Baltimore, December.

Ohio—Columbus, December 7-8-9.

AMERICAN SOCIETY OF ORTHODONTISTS.

There will be a meeting of the American Society of Orthodontists, held Monday, August 30, 1915, at 9:30 a. m., at San Francisco, in the room assigned the Orthodontia Section of the Panama-Pacific Dental Congress. It is respectfully requested that as many members of the American Society of Orthodontists, as possible, be present.

F. M. CASTO, Sec'y-Treas.
F. C. KEMPLE, President.

DISTRICT OF COLUMBIA BOARD OF DENTAL EXAMINERS.

The next examination of applicants for license to practise will be held at Georgetown University June 7, 8, 9, 10, 1915. Applications should be in the hands of the secretary two weeks before the date of examination.

STARR PARSONS, M. D., D. D. S.,
Secretary 1309 L St., N. W.,
Washington, D. C.

FLORIDA STATE DENTAL SOCIETY.

The annual meeting of the Florida State Dental Society will be held at Pass-a-Grille on the Gulf, June 9, 10 and 11. Great preparations are being made by the Executive Committee to make this meeting exceptionally strong and interesting and all Ethical Dentists of this or neighboring states are urged to be present. Ample and comfortable accommodations are available for all.

A. M. JACKSON, Sec., Lakeland, Fla.

IOWA STATE BOARD OF DENTAL EXAMINERS.

The next meeting of the Iowa State Board of Dental Examiners for the examination of candidates for licenses will he held at Iowa City, Iowa, commencing Monday, June 7th, at 9 A. M. For application blanks and so forth, address the secretary.

DR. J. A. WEST,
417 Utica Bldg.,
Des Moines, Iowa.

MISSOURI STATE BOARD OF DENTAL EXAMINERS.

The next meeting of the State Board of Dental Examiners will be held in Jefferson City, June 7th, 8th and 9th. All applications must be accompanied by a diploma from a reputable college, and a certificate of Entrance to the dental college; the certificate to show 15 units of credit. All applications must be filed with the secretary five days previous to the examination.

For further information address,
DR. GEORGE E. HAIGH, Secretary,
Jefferson City, Mo.

THE NEW JERSEY STATE DENTAL SOCIETY.

The forty-fifth annual convention of the New Jersey State Dental Society will be held at Asbury Park, New Jersey, July 21st, 22d, 23d and 24th, 1915, with headquarters at the Coleman House. The exhibits and clinics will be held at the Casino on the beach just across the ocean drive from the Coleman House. This glass-enclosed pavillion is over the ocean, and is an ideal place for this part of the convention. Practically every exhibitor of the 1914 convention signified his intention of returning to the 1915 gathering. The chairman of this committee, Dr. Chauncey F. Egel, of Westfield, has already arranged with other manufacturers for an exhibit, and is planning for a larger display than ever before.

Dr. W. W. Hodges, of Perth Amboy, Chairman of the Clinic Committee, is arranging for a course of clinics that will attract attention and be of great interest.

The ball room at the Coleman House will be used for the meetings of the Society. Dr. James I. Woolverton, Chairman of the Essay Committee, will have three essayists. The Executive office of the Society will be located in the Coleman House.

JOHN C. FORSYTH, Sec'y.

NORTH CAROLINA DENTAL SOCIETY

The next Annual Meeting of the North Carolina Dental Society will be held at Wrightsville Beach, June 23, 24, 25, 1915.

R. M. SQUIRES, Sec'y,
Wake Forest, N. C.

TO THE MEMBERS OF THE AMERICAN SCHOOL HYGIENE ASSOCIATION.

The next meeting of this Association will take place in the City of San Francisco, June 25th-26th, 1915.

Professor Lewis M. Terman, Stanford University, Stanford, Cal., is chairman of the Organizing Committee and chairman of the Program Committee. All communications relative to this meeting should be addrest to Prof. Terman.

Membership purchased in the American School Hygiene Association for 1914, entitles the holder to all privileges for membership for 1915. This action has been taken because the Association was unable to hold a meeting in 1914.

It is hoped that all members of the Association will make an effort to be present at the San Francisco meeting. Delegates should be sent from departments of education and departments of health in our city, county and state organizations. Our normal schools, colleges and universities should be repre-

sented. You are urged to use all the influence you can to secure the appointment of such delegates.

THOMAS A. STOREY, Secretary,
College of the City of New York.
New York City, N. Y.,

FLORIDA STATE BOARD OF DENTAL EXAMINERS.

The Florida State Board of Dental examiners will meet in Tampa June 4, 5, 7 and 8th, 1915, for the purpose of examining applicants who wish to practise is Florida.

All applicants must exhibit diploma from some reputable Dental school, and have recent photograph of self.

Fee of $25.00 must accompany application.

Florida does not interchange license with any state.

Any further information may be had from,

W. G. MASON, Sec'y,
Tampa, Fla.

THE NEW HAMPSHIRE DENTAL SOCIETY.

The New Hampshire Dental Society will meet this year at the New Hotel Weirs, Weirs, N. H., June 22, 23, and 24. Am sorry I could not get this to you in season to get it in the March Journal but the committee had a hard time deciding where to hold the meeting. Trust it will go in to the May number.

Very sincerely,
LOUIS IRVING MOULTON, D. D. S.,
15 No. Main St.,
Concord, New Hampshire.

ARKANSAS EXAMINATION.

The Arkansas State Board of Dental examiners will hold an examination at the Marion Hotel in Little Rock, Arkansas, on Monday, Tuesday and Wednesday, June 21st, 22nd and 23rd, 1915. Applicant must be a graduate of a reputable Dental School. Examination theoretical and clinical. Application and fee should be in the hands of the secretary fully two weeks before the axamination. For further particulars, write

IRVIN M. STERNBERG, Sec'y,
Fort Smith, Ark.

PENNSYLVANIA STATE DENTAL SOCIETY.

The forty-seventh annual meeting of the Pennsylvania State Dental Society will be held at Rajah Temple, Reading, Penna., on June 22nd, 23rd and 24th, 1915.

GEORGE S. SCHLEGEL,
Cor. Secretary,
147 N. 8th St., Reading, Pa.

THE DENTAL EDUCATIONAL COUNCIL OF AMERICA.

G. E. Mitchell, President.
J. V. Conzett, Vice-President.
H. L. Banzhaf, Secretary-Treasurer.

COMMITTEES.

Colleges.

W. E. Grant, Chairman, Louisville, Ky.
H. L. Banzhaf, Milwaukee, Wis.
A. L. Midgley, Providence, R. I.
Louis Meisburger, Buffalo, N. Y.
C. V. Vignes, New Orleans, La.

Curriculm.

H. E. Freisell, Chairman, Pittsburg, Pa.
G. E. Hunt, Indianapolis, Indiana.
A. R. Melendy, Knoxville, Tenn.
G. N. West, Chicago, Illinois.
J. L. Howell, Denver, Colo.

Legislation.

J. V. Conzett, Chairman, Dubuque, Ia.
L. L. Barber, Toledo, Ohio.
H. L. Wheeler, New York City.
G. E. Mitchell, Haverhill, Mass.
J. E. Christianson, Salt Lake City, Utah.

OHIO'S DELEGATES AND ALTERNATES TO N. D. A. FOR 1915.

Delegates.

(For two years.)

L. L. Barber, 718 The Spitzer, Toledo, Ohio.

H. C. Brown, 185 E. State Street, Columbus, Ohio.

L. E. Custer, 28 N. Ludlow, Dayton, Ohio.

J. R. Callahan, 25 Garfield Place, Cincinnati, Ohio.

(For one year.)

W. A. Price, 10406 Euclid Ave., Cleveland, Ohio.

F. M. Casto, 520-522 Rose Bldg., Cleveland, Ohio.

C. W. Mills, 52 W. Second Ave., Chillicothe, Ohio.

E. C. Mills, 151 E. Broad Street, Columbus, Ohio.

Alternates.

W. E. Knight, Delaware, Ohio.
G. J. Hawkins, Salem, Ohio.
H. H. Erskine, Steubenville, Ohio.
J. H. Linsley, Ashtabula, Ohio.
T. S. Ward, Marietta, Ohio.
L. E. Vinez, Louisville, Ohio.
W. H. Sedgwick, Newark, Ohio.
C. W. Sheridan, Piqua, Ohio.

OHIO'S DELEGATES TO PANAMA-PACIFIC DENTAL CONGRESS.

H. C. Brown, 185 E. State Street, Columbus, Ohio.

W. A. Price, 10406 Euclid Ave., Cleveland, Ohio.

C. I. Keely, Hamilton, Ohio.

IMPORTANT RULING UNDER THE HARRISON ANTI-NARCOTIC LAW.

We are sure the following ruling under the Harrison Anti-Narcotic Law, covering the cases of dentists who have not complied with the state laws, will be gratifying to all law abiding dentists.

Louisville, Ky., March 5, 1915.

Dr. J. H. Baldwin, Sec'y.
Louisville, Ky.

Dear Dr. Baldwin: We are just in receipt of a letter from the Collector of Internal Revenue advising us that, as suggested in our letter, the Commissioner of Internal Revenue has ruled that the terms, "legitimate practise of his profession," as used in the Harrison Anti-Narcotic Law, require that a physician, dentist or veterinary surgeon, in order to register under the provisions of this law, must have complied with all of the laws of the state in which such physician, dentist or veterinary surgeon resides.

Yours very truly,
Signed: ARTHUR H. MANN,
Counsel.

State boards should be able to render aid to the Collector of Internal Revenue by opening to him the records of dentists who are law abiding.

QUACK DENTISTRY TEACHERS FINED BY JUDGE PRINDIVILLE.

State and City Dental Authorities Trap Cassius M. Carr and John J. Kitteringham.

Two more quacks—advertisers, this time, of a "sure cure for pyorrhea"—were put out of business in Chicago yesterday. They are Cassius M. Carr of 527 East Thirty-fourth street and John J. Kitteringham Jr., of 531 East Thirty-fourth street. Carr and Kitteringham have been conducting the "College of New Dentistry" in room 900 at 30 North Dearborn street. Their principal stock in trade has been an offer to teach dentists their "positive cure" for pyorrhea, the most baffling complaint known to dentistry, on payment of $350.

A set of 150 dental instruments was included in the bargain, and the school until recently did a thriving business.

Two months ago the school was brought to the attention of Dr. Charles F. O'Connor, president of the Illinois state board of dental examiners, and Dr. George N. West, chairman of the committee on laws and infractions of the Chicago Dental society. Drs. O'Connor and West made an investigation and turned the case over to Assistant State's Attorney Henry Eckhardt.

Four lawyers and a score of witnesses appeared for Carr and Kitteringham in Judge Prindiville's court, but the two were found guilty of practising dentistry in Illinois without a state license and each was fined $50 and costs.—The Chicago Daily Tribune, April 22, 1915.

One of the best known dentists in Chicago, in commenting on this case, says, "This man has a license in Utah, given while it was a territory, without examination, without college education, just by affidavit, and I would not believe him under oath myself. He goes from one state to another, giving this course of instruction, and it is plainly in violation of law."

When will the dental profession, rise up in its righteous indignation, against this form of quackery and see that all cases are summarily dealt with? Now is the opportune time. Many of our states need a Drs. O'Connell or West, to prosecute these quacks in the dental profession.

Such quackery often, by its cunning advertising schemes, etc., deceive the very elect. Let's stamp it out. Is your state prosecuting these quacks?

CONNECTICUT'S DELEGATES AND ALTERNATES TO N. D. A. FOR 1915.

Delegates.

Dr. Edward S. Gaylord, New Haven.
Dr. Alfred C. Fones, Bridgeport.
Dr. Charles McManus, Hartford.

Alternates.

Dr. R. H. W. Strang, Bridgeport.
Dr. Albert W. Crosby, New Haven.
Dr. Louis L. Beach, Bristol.

THE JOURNAL'S ADVERTISING PAGES.

Most up-to-date business men know that the successful marketing of a high-grade product depends largely upon a proper degree of intelligent advertising, and intelligent advertising, from a dental standpoint, at once suggests The Journal of the National Dental Association, for it contains the most scientific reading matter, with a quantity of circulation greater than that of any other dental magazine published in the world, intimate introducing by its plan of subscription into the offices of practically every successful dentist in the United States. Dentists who want the best and have the wherewithal to pay for it, have a sustained interest in the success of The Journal. He who helps, financially, to promote the interest of our own publication, will receive the good will and financial reward of the great dental profession.

Only the highest type of advertising is accepted; therefore an "ad" in The Journal is a recommendation for the goods advertised. Every dollar derived from advertising is expended in improving The Journal. Rate Card, etc., upon application.

Every dentist should remember that to "Mention The Journal identifies you."

BURS RECUT
20c PER DOZEN

Cut and stoned on latest type automatic bur machine. Keenness of cutting blades restored. Original shapes retained.

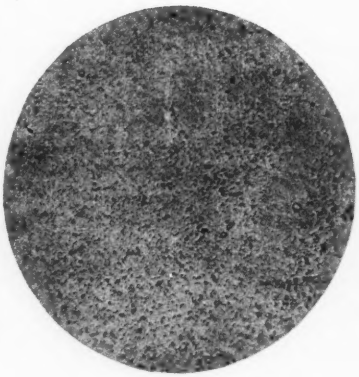
Prompt Service. Satisfaction Guaranteed.

If you want to say
"This is the best job I ever had done,"
Send them to us.

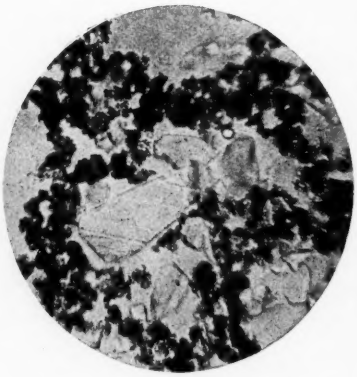
NEEDHAM BUR WORKS
Needham Bldg., 32 & Cottage Grove Ave.
F. 18. CHICAGO

KOLYNOS

EXAMINE KOLYNOS DENTAL CREAM under the microscope and compare it with ordinary tooth pastes. KOLYNOS *CLEANS* Teeth and Gums; it does not "scour" them.



Kolynos x 500



An ordinary tooth paste x 500

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